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TRANSACTIONS

OF THE

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ENTOMOLOGICAL SOCIETY,

AND

PROCEEDINGS

OF THE

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OF THE

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TRANSACTIONS

OF THE

AMERICAN ENTOMOLOGICAL SOCIETY.

VOLUME XIV.

A monograph of the APHODIINI inhabiting the United States.

BY GEORGE H. HORN, M. D.

In the volume of these Transactions for 1870 and 1871 the first attempt was made at a synopsis of the Aphodiini of our fauna. The material used was derived from the series of Dr. LeConte, whose cabinet was then in my care during his absence in Europe, supplemented by those in my cabinet. The object of the papers above referred to was to bring together in a descriptive catalogue the species then known, with synoptic tables to aid in their determination. The old species were, for the most part, passed with mere mention, the new ones were given brief, but sufficient descriptions. In the meantime no opportunity has been allowed to pass that would add to the value of the series. Since that publication was made a number of the more striking forms were placed in Dr. LeConte's hands and have been described in the "Bulletin of Hayden's Survey" 1878; all of these were Aphodius. Shortly after several Ægialia and Rhyssemus were described elsewhere, as will be seen in the bibliography. A large number, relatively, remain to be described, and as the series before me is as full as can be expected the present opportunity has been taken to give as complete a work as possible. The genera will be considered in the order in which they are usually placed, and should any discussion of the relations of the genera among themselves be deemed necessary, it will be given at the end.

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APHODIUS Illiger.

At the time of my previous essay on this genus it was supposed that the fauna of our country had been nearly exhausted and that but few new species remained to be discovered. Without any general work the collectors in various parts of the country were unable to separate their species, but it soon became evident that more attention was being given to the collection of the species by the aid given by the synopsis, imperfect as it was. In less than ten years new forms were sent me equalling in numbers those described by me as new. The more conspicuous of these were described by Dr. LeConte as already stated.

In the synopsis of 1870 fifty-one species are given, one other was accidentally omitted. Of these six are now considered synonyms. The present essay enumerates eighty-two, nearly double the number. Of these all are known to me in nature excepting *cadaverinus* and *guttatus*, and seventy-eight are represented in my cabinet. Having thus about as complete a series as usually falls to the lot of any one it has been deemed expedient to review the whole material and bring together fuller descriptions in one paper. As has been my custom for some years the synonymy and bibliography have been placed as a concluding portion and made complete so far as concerns our fauna, the greater part of the synonymy of European species being omitted. In these latter, besides the original citation, I have added references to more modern and better descriptions, to which the student is referred for fuller details of variations than I have thought necessary to give.

The great increase in the number of species has required some modification of the arrangement made use of in my previous papers, although I have endeavored to follow the lines proposed by Erichson as far as our species would permit. It has seemed desirable to adopt a course intermediate between that of Erichson and Mulsant, and to recognize certain primary divisions to be called subgenera, without, however, going to the extreme of the latter author.

In our fauna four subgenera are recognized—*Teuchestes*, *Colobopterus*, *Diapterna* and *Aphodius* (proper), the first two being represented by introduced European species; the third is peculiar to our fauna, and all have the large scutellum. *Aphodius* contains all the species with small scutellum, and has been greatly subdivided, but with our material we must either disregard the names proposed for these divisions or nearly double the number at present existing.

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After the scutellum the next most important division is based on the arrangement of the spinules surrounding the apex of the hind tibiæ, whether equal or unequal. A little experience will enable one to determine to which series a species belongs even when the spinules are worn to nearly an equal size. Any synoptic division beyond this point is purely speculative; for, whatever character is used, there will necessarily be an artificial result.

Two characters to which attention is particularly directed by C. G. Thomson (Skand. col. v) have been used in the following pages with good results: (1) whether the anterior face of the front tibiæ is smooth or punctured, and (2) whether the first anterior tarsal joint is of equal or greater length or shorter than the second. The length of the first joint of the hind tarsus has also great value in separating species otherwise closely allied.

The carination of the mesosternum between the coxæ is always a character of moment, although at times it loses importance beyond specific value, as in *lentus*, *explanatus* and *inquinatus*.

The sexual characters of our species seem far more varied than in the European forms. To dwell particularly on these at this time seems unnecessary, as they are fully explained in their proper places, and no special use is made of them in the tables.

In accordance with the views expressed in the preceding remarks it is proposed to divide the genus Aphodius into the following subgenera:

Scutellum long, one-fourth or one-fifth the length of the elytral suture.
  Hind tibiæ fimbriate with equal spinules.
    Scutellum not impressed; first joint of hind tarsus ♂ simple; anterior tibiæ not serrulate above the teeth.....Subgen. TEUCHESTES.
    Scutellum longitudinally impressed; first joint of hind tarsus ♂ with recurrent process; anterior tibiæ serrulate above the teeth.
    Subgen. DIAPTERNA.
  Hind tibiæ fimbriate with unequal spinules; scutellum not impressed: anterior tibiæ feebly serrulate above the teeth; hind tarsi ♂ simple.
    Subgen. COLOBOPTERUS.
Scutellum small, not more than one-eighth or one-tenth the length of the suture; hind tarsi ♂ simple; characters otherwise very variable.
  Subgen. APHODIUS.

Subgen. TEUCHESTES *Muls.*

Scutellum large, nearly one-fourth the length of the elytra. Anterior tibiæ tridentate, not serrulate above, the anterior face smooth, the tarsus with the first joint shorter than the second. Posterior

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tibiæ fimbriate with short equal spinules; first joint of hind tarsus a little longer than the three following. Front tuberculate in both sexes.

One species forms this group.

A. fossor Linn.—Oblong, very convex, black, shining. Head sparsely punctate, clypeus broadly feebly emarginate, genæ prominent, but obtuse. Antennæ ferruginous, club piceous, palpi piceous. Thorax convex, smooth, a few coarse punctures toward the sides and near the front angles; sides arcuate, sinuate in front of the hind angles, base subtruncate, a deeply impressed marginal line. Elytra strongly convex, a little longer than wide, striate, striæ moderately closely punctured, intervals slightly convex, smooth. Mesosternum not carinate. Metasternum moderately closely punctate at the sides, abdomen obsoletely punctate. Posterior femora sparsely punctate and with an irregular row of coarse punctures. Length .40–.44 inch; 10–11 mm.

Male.—Head trituberculate, the middle tubercle more prominent. Thorax with a slight depression in front. Anterior tibial spur stout, broader to tip and obtuse. Metasternum deeply impressed.

Female.—Head feebly trituberculate. Thorax not impressed in front. Anterior tibial spur more slender toward the tip and acute. Metasternum less concave.

A variety (*sylvaticus*) occurs in Europe in which the elytra are red.

This species has been introduced from Europe into the New England States and Canada, but seems not to have become very abundant.

Subgen. DIAPTERNA *Horn.*

Scutellum large, more than a fourth the length of the suture. Anterior tibiæ normally tridentate, not serrulate above, the anterior face smooth; first joint of the tarsus shorter than the second. Posterior tibiæ fimbriate at apex with unequal spinules; the first joint of the tarsus nearly as long as the next three. Front not tuberculate in either sex.

The characters of this group are as well marked as those to which generic names have been given in the Mulsant system of division. It seems to be peculiar to our fauna.

Since my previous study of the species of this group (Trans. Am. Ent. Soc. 1870, p. 111) Baron Harold has received sufficient material to warrant the expression of opinion that the six species there indicated constitute but one. In a letter to him anterior to his publication (Berl. Zeitschr. 1874, p. 182) I assented to his view, except as to *occidentalis*. A further study, however, has modified my opinion, which may be expressed in the following table:

Thorax wider in front and broader than the elytra; first joint of posterior tarsus ♂ longer than the next three joints, the hook large..... **validus.**

Thorax not wider in front and not wider than the elytra; first joint of hind tarsus ♂ shorter than the next three, the hook rather feeble.... **hamatus.**

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The characters on which the other species were separated were the apparently more truncate elytra, the basal marginal line of the thorax, and the deeper or fainter striæ. I am now convinced that these must be entirely disregarded, as there is not that constancy making them worthy of consideration. It is also possible that the characters used for the separation of *validus* may fail.

A. validus Horn.—Form robust, convex, piceous or black, shining. Head very sparsely finely punctate. Clypeus almost semicircular, feebly truncate at middle, the genæ moderately prominent, but obtuse. Antennæ ferruginous. Thorax very convex, broader than the elytra, widest near the middle, sides arcuate, narrowed at base, basal marginal line distinct, disc smooth, very sparsely, minutely punctate with coarser punctures toward the sides and at the hind angles, the latter distinct, but obtuse. Elytra narrower than the thorax, very little longer than wide conjointly, striate, the striæ not closely punctured, intervals flat or slightly convex, with extremely minute punctures sparsely placed. Mesosternum not carinate. Metasternum coarsely punctured at the sides. Abdomen sparsely punctate. Posterior femora coarsely and irregularly punctate. Length .32 inch; 8 mm.

Male.—Anterior tibial spur spatulate, broader toward the tip and curved inwardly. Upper spur of middle tibia less than half the length of the lower. Posterior tarsi with the first joint a little longer than the next three together and with an acute recurrent process, forming with the joint the letter V.

Female.—Unknown.

The facies of this species is more robust, the elytra shorter and more arcuate on the sides, the legs are also shorter, and the hind tibiæ, especially, thicker than in the following species.

Three specimens collected at Abittibi House in the Hudson's Bay Territory.

A. hamatus Say.—Form oblong-oval, moderately robust, piceous or black, the elytra varying to brown, and often with a paler suture and margin. Antennæ ferruginous, club darker. Clypeus with oblique sides, in front truncate and vaguely emarginate. Head almost entirely smooth or with extremely few very fine punctures. Genæ moderately prominent, but obtuse. Thorax convex, not wider than the elytra, surface with a few fine punctures sparsely placed, often entirely obsolete, toward the sides a few very coarse punctures; sides arcuate, when viewed from above they are parallel at basal half, basal marginal line variable, rarely entire, usually more or less interrupted, and very rarely entirely absent. Elytra longer than wide conjointly, sides usually parallel at middle, striate, the striæ not closely punctured, intervals flat or slightly convex, and usually with a few extremely fine punctures. Mesosternum not carinate. Metasternum coarsely obsoletely punctured at the sides. Abdomen sparsely punctate. Posterior femora sparsely, irregularly punctate. Length .24-.40 inch; 6-10 mm.

Male.—Anterior and middle tibial spurs as in *validus*. First joint of hind tarsus shorter than the next three, the recurrent process slender, very acute and forming a wider angle.

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Female.—Anterior tibial spur slender and acute at tip. Upper middle tibial spur longer than half the lower. First joint of hind tarsus slender, rarely as long, never longer than the next three together.

This species varies in the color of the elytra, usually they are piceous, but may vary to brown, while many from Utah and Oregon have the base, suture and side margin much paler.

In many specimens, especially females, the elytra are apparently truncate at apex, allowing the pygidium to be exposed, but this is so variable in appearance, as has been observed in *erraticus*, that no part can be drawn from it.

Occurs from Maine to Oregon, in the region north and a little south of the great lakes and in the mountain region extending south to New Mexico and northward to Hudson's Bay.

Subgen. COLOBOPTERUS *Muls.*

Scutellum elongate, one-fifth the length of the suture. Anterior tibiæ tridentate, not serrulate above, the anterior face smooth, the tarsus with the first joint shorter than the second. Posterior tibiæ fimbriate at tip with unequal spinules. Front tuberculate at middle in the male.

One species represents this group in our fauna.

A. erraticus Linn.—Subdepressed, black, elytra greyish yellow with the suture darker. Head rather densely punctate, the clypeus feebly emarginate, the genæ rounded, not prominent; antennæ piceous. Thorax moderately closely punctate, the hind angles obtuse, the base sinuate in front of the humeri, basal marginal line entire. Elytra scarcely longer than wide conjointly, striate, striæ finely punctured, intervals very slightly convex, finely alutaceous, finely not densely punctate, apex subtruncate. Body beneath sparsely punctate at middle, more coarsely at the sides. Posterior femora sparsely punctate; first joint of hind tarsus as long as the three following. Length .30 inch; 7.5 mm.

The only sexual distinction observed is the small, but very evident tubercle of the front of the male, the head of the female being entirely plain.

This species has been introduced from Europe, doubtless through commerce, into the Middle States. Many years ago Melsheimer described a specimen under the name *pensvallensis*, but whether from a specimen actually native or an accidental cabinet specimen is not known. It has, however, been taken in numbers by Mr. Otto Lugger near Baltimore. It is widely distributed in Europe.

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Subgen. APHODIUS *Auct.*

Scutellum small, not more than an eighth or a tenth the length of the elytral suture.

This character is about the only one which can be used to distinguish the mass of species which follows from the comparatively few which precede. Various attempts have been made to divide the series, and about a dozen names have been proposed by Mulsant and Motschulsky for sections of variable extent, but the characters have been found to possess very little value and to have such a shadowy foundation that most recent authors have abandoned them entirely. They are, however, divisible by characters sometimes very sharply defined and nearly as often evanescent, into groups which vary in the number of species they contain. The greatest difficulty is in determining to what extent division should be carried.

As subdivision by synoptic tables is intended to assist in the determination of species and not to enable the author to illustrate his ideas of the intricate relationships of the groups or species among themselves, the simpler and shorter the primary tables are made the more nearly do they serve the purpose of their publication. It has seemed to me at all times better to discuss synthetic matters entirely apart from the tables. The object should be to enable the student-reader to determine the species with all possible facility and accuracy, this accomplished he will be enabled to follow intelligently any discussion. Progress in Natural History necessarily starts from a basis of species, and until these are accurately described so that others can arrive at a knowledge of them no great advance is possible.

In the endeavor to subdivide *Aphodius* proper I have followed the plan of Erichson (Insect. Deutschl. vol. iii) with modifications to suit the evidently more heterogeneous material of our fauna. The suggestion of groups for species which have no equivalents in the European fauna is necessary, and will be understood, but among the species fimbriate with unequal spinules I have been compelled to ignore one of Erichson's main subdivisions based on the tuberculate or simple head, from the fact that among our species the character is evanescent.

There are other difficulties with this method of subdivision, as there will be with any that can be proposed, which will be alluded to in their proper places.

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The following table gives the subdivisions called groups, which I had hoped to name from some characteristic species in place of letter, but this proved to be inadmissible:

Apex of hind tibiæ fimbriate with short equal spinules.
  Head more or less tuberculate.
    Thorax with distinct basal marginal line.
      Clypeus quadriangulate or quadridenticulate.....GROUP **A.**
      Clypeus emarginate, sometimes feebly biangulate.
        Mesosternum not carinate between the coxæ.....GROUP **B.**
        Mesosternum distinctly carinate.....GROUP **C.**
    Thorax without trace of basal marginal line.....GROUP **D.**
  Head not at all tuberculate.
    Mesosternum not carinate; thorax not narrowed at base.
      Head coarsely roughly punctured; clypeus dentate each side of emargination and more externally angulate..... GROUP **E.**
      Head evenly convex and punctate; clypeus feebly emarginate....GROUP **F.**
    Mesosternum carinate between the coxæ; thorax narrower at base.
GROUP **G.**
Apex of hind tibiæ fimbriate with unequal spinules.
  Elytra opaque, usually black, often strigose or granulate.....GROUP **H.**
  Elytra more or less shining.
    Thorax not narrower at base than apex.
      Elytra not pubescent.
        Head tuberculate or not, never very roughly punctured, and without transverse clypeal ridge.....GROUP **I.**
        Head very roughly punctate, without frontal tubercles, clypeus with a transverse ridge.....GROUP **K.**
      Elytra more or less pubescent.....GROUP **L.**
    Thorax narrower at base than apex; humeri of elytra dentiform.
GROUP **M.**

GROUP **A.**

Scutellum small. Posterior tibiæ fimbriate with equal spinules at tip. Anterior tibiæ tridentate, serrulate or crenulate above, the anterior face smooth. First joint of anterior tarsi shorter than the second. First joint of hind tarsi variable. Head more or less tuberculate, the clypeus quadridentate in front. Mesosternum not carinate. Thorax with entire basal marginal line.

Two species enter this group and are thus distinguished:

Entire margin fimbriate, the posterior tibiæ fimbriate internally with long hairs. Anterior tibiæ coarsely serrate in the upper half. First joint of hind tarsus not longer than the next two. Color uniformly piceous.....**denticulatus.**

Margin not fimbriate, posterior tibiæ not fimbriate. Anterior tibiæ feebly serrulate above. First joint of hind tarsus as long as the next three. Color black, elytra often maculate with pale round spots on intervals 3-5-7.
conspersus.

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A. denticulatus Hald.—Oblong, slightly broader posteriorly, piceous, shining; suture, epipleural margin, under side and legs brownish, the entire margin fimbriate with yellowish hairs. Antennæ pale ferruginous. Head rather coarsely and moderately densely punctured ♀ or smoother ♂, frontal suture elevated, but not divided in tubercles, a transverse carina at middle of clypeus. Clypeus broadly triangularly emarginate, on each side acutely toothed and more externally a less prominent angulation, sides of clypeus oblique, genæ moderately prominent but obtuse. Thorax narrower than the elytra, slightly narrowed in front, sides (viewed from above) feebly arcuate, hind angles broadly rounded, surface sparsely punctured, the punctures equally disposed composed of coarse and fine intermixed. Elytra a little wider behind the middle, striate, striæ not closely punctured, intervals slightly convex, with very few extremely fine punctures. Body beneath piceous, abdomen always paler; metathorax and abdomen sparsely punctate and with few yellowish hairs. Posterior femora smooth, with an irregular row of punctures near the posterior border externally. Length .22-.30 inch; 5.5-7.5 mm.

Male.—Head less punctured, elevations more distinct. Anterior tibial spur stouter. Upper spur of middle tibia less than one-third the length of the lower.

Female.—Head more closely punctured, elevations feeble. Anterior tibial spur slender. Upper spur of middle tibia half as long as the lower.

This species is notable in the form of the clypeus and the fimbriate margin. The hind tibiæ are conspicuously fimbriate within, the hairs longer and more numerous in the male.

Occurs in the Rocky Mountain region from Wyoming to New Mexico.

A. conspersus n. sp.—Form oblong, parallel, black, shining, alternate intervals of elytra with small round pale spots. Antennæ piceous. Head densely, roughly punctured, frontal suture slightly elevated and tuberculate at middle ♂, or with obsolete tubercle only ♀. Clypeus with a short transverse carina, the anterior border emarginate at middle and on each side bidentate, teeth acute, the middle ones a little longer, sides of clypeus arcuate, genæ slightly prominent and very obtuse. Thorax as wide as the elytra, slightly narrowed in front, sides feebly arcuate, hind angles distinct but obtuse, disc convex, sparsely but very regularly punctate at middle, a little denser at the sides, punctures rather fine. Elytra moderately deeply striate, striæ closely punctured, intervals slightly convex, sparsely punctate. Body beneath black, very sparsely punctate. Hind femora sparsely punctate, without row of punctures. Length .18-.20 inch; 4.5-5 mm.

Male.—Anterior tibial spur long, moderately stout, slightly hooked at tip. Upper spur of middle tibiæ short.

Female.—Anterior tibial spur slender and acute at tip. Upper spur of middle tibia half as long as the lower.

In the color of the elytra this species varies in a manner similar to *bicolor*, the spots being rarely very well marked while it is still rarer to find the elytra entirely black.

Occurs in California, Mendocino Co.

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GROUP **B.**

Scutellum small. Front distinctly trituberculate, clypeus in several species with a transverse ridge. Anterior tibiæ distinctly tridentate, feebly crenulate above, the first joint of the tarsus shorter than the second. Hind tibiæ fimbriate with short equal spinules, the first joint of the tarsus variable in length. Mesosternum not carinate.

The species of this group although not numerous are of difficult study. The group is not very homogeneous, and the species are aggregated from the possession of certain striking characters above noted.

The following table will assist in distinguishing the species:

Clypeus emarginate, the angles on each side acute, almost dentiform.
  Small species, totally black, first joint of hind tarsus not as long as next three. **crassulus.**
  Large species, elytra clear red, first joint of hind tarsus as long as next three. **bidens.**
Clypeus feebly emarginate, the angles on each side rounded or at most obtusely prominent.
  Thorax dissimilar in the sexes, compressed in front in the male; elytra clear red..... **fimetarius.**
  Thorax similar in the sexes, elytra piceous or dull red.
    Anterior angles of thorax paler, usually with a conspicuous yellow spot, sometimes barely perceptibly paler.
      Clypeus without trace of transverse carina.
        Clypeus on each side of emargination rounded in both sexes; striæ of elytra not deeply impressed, intervals very flat.... **congregatus.**
        Clypeus on each side subangulate, more so in ♀; striæ of elytra deep, crenately punctate, intervals convex..... **aleutus.**
        Clypeus subangulate; striæ of elytra fine, intervals flat; elytra uniformly reddish brown..... **fœtidus.**
      Clypeus with distinct transverse carina.
        Elytra deeply striate, crenately punctate, intervals convex.... **duplex.**
    Species totally black, anterior angles of thorax never paler.
      Clypeus with transverse carina; elytra finely alutaceous, subopaque. **pectoralis.**
      Clypeus without transverse ridge.
        Small species (.18-.22 inch) facies robust..... **ruricola.**
        Large species (.28-.30 inch) oblong..... **anthracinus.**

A. crassulus Horn.—Form short, robust, broader behind, black, shining, legs rufo-piceous. Antennæ reddish brown. Head coarsely punctured, sparsely on the vertex, more densely in front. Clypeus emarginate at middle and on each sharply angulate or dentate, the sides arcuate, genæ slightly prominent, but obtuse. Thorax slightly narrower in front, sides feebly arcuate, hind angles very obtuse, disc convex, the punctures rather coarse, very regularly distributed, not closely placed Elytra slightly wider behind the middle, humeri obtuse, disc

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striate, striæ crenately punctured, intervals flat, with extremely fine sparsely placed punctures. Body beneath very sparsely punctate; posterior femora sparsely punctate, with a series of three or four punctures near the knee. First joint of hind tarsus as long as the next two. Length .18–.20 inch; 4.5–5 mm.

In the male the spur of the anterior tibiæ is stouter and more curved and the posterior femora have more numerous punctures.

This species is notable by its short robust form resembling some of our species of Ægialia.

Occurs from Florida to Texas.

A. bidens Lec.—Oblong oval, convex, black, shining, elytra and legs red, these paler, anterior angles of thorax paler. Antennæ ferruginous. Head sparsely, rather finely punctate. Clypeus hemihexagonal, broadly emarginate in front and on each side sharply angulate, genæ prominent, but obtuse. Thorax convex, black, shining, the anterior angles paler, sides parallel posteriorly, arcuate in front, hind angles very obtusely rounded, base slightly sinuate on each side, disc sparsely rather finely punctate, the punctures equally disposed, but somewhat unequal in size. Elytra slightly narrower at base than the thorax, the humeri distinct, but obtuse, disc striate, the punctures rather fine and not serrate, intervals slightly convex, with very fine sparse punctures. Body beneath very sparsely punctate; hind femora sparsely punctate. First joint of posterior tarsus as long as the next three. Length .26–.28 inch; 6.5–7 mm.

The two specimens before me are probably females, and show no sexual differences.

At first glance this species so closely resembles *fimetarius* in form and color that these two might be readily confused.

Occurs in Colorado. The type in my cabinet has no special locality, a second from Mr. E. A. Schwarz was collected at Veta Pass at an elevation of more than 9000 feet.

A. fimetarius Linn.—Oblong oval, very convex, black, shining, elytra uniformly red. Antennæ ferruginous. Head sparsely, rather finely punctulate, somewhat rugulose in front, vertex trituberculate, the middle tubercle stronger. Clypeus hemihexagonal with a feebly elevated transverse carina, angles broadly rounded, at middle broadly but feebly emarginate, the sides oblique, slightly sinuate, genæ feebly prominent and very obtuse. Thorax transverse and very convex, black, shining, the front angles with large reddish yellow space, surface with coarse, very irregularly placed punctures with finer punctures in the intervals, sides arcuate, hind angles broadly rounded, base slightly sinuate each side. Elytra as wide as the thorax, the humeri obtuse, disc striate, striæ crenately punctured, the intervals slightly convex with few fine punctures. Body beneath sparsely punctate, densely at the sides of metasternum. Legs dark reddish brown, tarsi paler. Posterior femora sparsely punctate, a row of coarser punctures near the knee. First joint of hind tarsus equal to the next three. Length .26–.34 inch; 6.5–8.5 mm.

Male.—Frontal tubercles more developed, the intermediate subcornute. Thorax more convex, impressed in front. Anterior tibial spur stout and curved, upper spur of middle tibia less than half the length of the lower and stout.

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Female.—Frontal tubercles less prominent. Thorax smaller, less convex, not impressed in front. Spur of anterior tibia slender, less curved, the upper spur of middle tibia at least half the length of the lower.

Among the specimens collected in our fauna I have observed very little variation, but Harold (Berl. Zeitsch. 1863, 338) notes a form with the thorax entirely black.

This species has been introduced from Europe, and is quite common in the Atlantic region. It extends from Canada to Texas, and from Maine to Illinois. It will probably invade every portion of our territory.

A. congregatus Mann.—Oblong, moderately convex, slightly broader behind ♀, piceous, shining, anterior angles of thorax pale, legs rufo-testaceous, elytra variable in color, from rufo-testaceous with indistinct cloudings to nearly piceous with the apices only paler. Antennæ rufo-testaceous with darker club. Head sparsely punctate, in front slightly rougher, front feebly trituberculate. Clypeus hemihexagonal, apex truncate and feebly emarginate, the angles broadly rounded, sides oblique, genæ feebly obtusely prominent. Thorax narrowed in front, sides feebly arcuate, hind angles distinct, but very obtuse, disc rather sparsely punctured with intermixed punctures denser near the sides. Elytra not wider than the thorax, finely striate, striæ not closely punctured, intervals very flat with extremely fine punctures. Body beneath sparsely indistinctly punctured, the abdomen distinctly alutaceous. Posterior femora with extremely few, very fine punctures, first joint of hind tarsus very little longer than the next two. Length .18–.22 inch; 4.5–5.5 mm.

The males are usually smaller than the females, the form more parallel, the frontal tubercles very little more prominent, and the spur of the front tibia a little thicker.

The color of the elytra varies considerably in this species. The ground color is dark rufo-testaceous, with indistinct cloudings of darker color. The dark spaces are very indistinctly limited, but when studied carefully seem to be of the same type in form and arrangement as in *inquinatus*. From rufo-testaceous the elytra become gradually darker, so that merely the apices are indistinctly paler.

With this species I have no hesitation in uniting *arcticus* Harold, as it seems to be merely the darker form described above.

Occurs from Northern California to Alaska.

A. aleutus Esch.—Oblong, moderately elongate, piceous, shining, elytra variable in color from dark red to black, sometimes with traces of a design, legs rufo-piceous. Antennæ rufous, club piceous. Head sparsely punctate, in front subrugose; front trituberculate. Clypeus hemihexagonal, anteriorly truncate and emarginate, more deeply in the ♀, the angles very distinct, but obtuse; genæ moderately prominent, but obtuse. Thorax narrower in front, the sides arcuate, hind angles distinct, obtuse, disc moderately convex, surface punctate

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with coarser and finer punctures intermixed, slightly denser at the sides, anterior angles of thorax usually with a large pale space, rarely the spot is obsolete, Elytra moderately deeply striate, the striæ closely, but not deeply punctured. intervals convex, but to a variable degree, the finer punctures scarcely perceptible. Body beneath very sparsely punctate, the mesosternum almost absolutely smooth. Posterior femora almost smooth, first joint of hind tarsus nearly as long as the next three. Length .20–.26 inch; 5–6.5 mm.

The sexual differences are scarcely evident beyond the slightly deeper clypeal emargination of the female and the more robust anterior tibial spur of the male.

This species and *congregatus* are closely related and difficult to distinguish by the table or description, but in the present species the striæ of the elytra are always deeper and more distinctly punctured, and the intervals convex, while in *congregatus* they are absolutely flat.

The variation in color is well marked. In the typical form the elytra are dark red and the anterior angles of the thorax with a well marked pale spot. I have specimens in which the elytra are somewhat maculate, and the design, carefully studled, is of the same type as in *pardalis*. Specimens are, however, abundant (three from Colorado) in which the entire surface is quite black, and even the pale spot at the anterior angles of the thorax almost or even entirely disappeared. These latter are *ursinus* Motsch. These resemble *pectoralis*, which has the elytra, however, distinctly alutaceous, and the clypeus with a distinct transverse carina.

Occurs from the high regions of Colorado westward to California, Oregon, Washington Territory, and northward to Alaska. The variety *ursinus* occurs also in Kamtschatka.

A. fœtidus Fab.—Oblong oval, slightly broader behind, black, shining, elytra and legs brownish red. Antennæ reddish brown with darker club. Head distinctly alutaceous, sparsely punctate, the frontal tubercles feeble. Clypeus hemihexagonal, feebly emarginate at middle, the angles rounded, the genæ feebly prominent. Thorax narrower in front, the sides feebly arcuate, base regularly arcuate, hind angles distinct, but obtuse, disc convex, black, the anterior angles always paler, surface moderately coarsely, but very evenly punctate, more densely in the female. Elytra not as wide as the thorax ♂ or equal ♀, the disc striate, striæ crenately punctured, intervals slightly convex, distinctly alutaceous and with fine irregularly placed punctures. Body beneath sparsely punctate, the surface distinctly alutaceous. Posterior femora sparsely punctate, the first joint of the hind tarsi as long as the next three. Length .16–.20 inch; 4–5 mm.

The sexual differences are very feeble. As a rule the male is smaller and less broadened behind, the clypeus and thorax less closely punctured. The thorax is also distinctly broader in the male, so that the base of the elytra seems narrower than it.

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The surface being very finely alutaceous, the specimens have at all times a greasy aspect.

This species has probably been introduced from Europe, but is so widely diffused in our territories, occurring from the Atlantic coast to Colorado and New Mexico.

A. duplex Lec.--Oblong, subcylindrical, piceous or brownish, the anterior angles of the thorax paler, legs reddish brown. Antennæ brownish, the club piceous. Head sparsely rather coarsely punctate, the clypeus more rugose, front trituberculate. Clypeus hemihexagonal, the sides slightly sinuate, anteriorly broadly truncate and feebly emarginate, the angles much rounded, genæ slightly prominent, but very obtuse, a distinct transverse carina parallel with the front margin. Thorax convex, slightly narrower in front, the sides feebly arcuate, hind angles rounded, base on each side feebly sinuate, punctuation rather coarse and sparse on the disc, denser and finer near the sides. Elytra not wider at base than the thorax, striæ rather deep and crenately punctured, intervals slightly convex and with few very fine punctures. Body beneath sparsely punctate and slightly alutaceous, the hind femora very sparsely punctate. First joint of hind tarsus shorter than the next three. Length .16–.18 inch; 4–4.5 mm.

The sexual differences are very feeble and consist in the slightly more prominent frontal tubercles, smaller size and narrower form of the male.

The presence of the transverse clypeal carina is less of a peculiar character than supposed by Dr. LeConte. The species looks not unlike some of the smaller forms of *granarius*.

Occurs in Colorado.

A. pectoralis Lec.—Oblong, convex, black, shining, elytra subopaque with greasy aspect. Antennæ piceous. Head sparsely punctate, front trituberculate. Clypeus with slight transverse carina, hemihexagonal, at middle feebly emarginate, the angles distinct, but not prominent, sides oblique, genæ slightly prominent, obtuse. Thorax convex, the sides parallel behind, arcuate in front, hind angles distinct, but obtuse; base regularly arcuate, disc sparsely, moderately coarsely punctate, with finer punctures intermixed. Elytra as wide as the thorax, sides parallel, humeri distinct, disc striate, striæ crenately punctured, intervals flat, distinctly, but finely alutaceous, with extremely minute sparse punctures. Body beneath more shining than above, sparsely punctate. Mesosternum opaque, strigose. Posterior femora very sparsely punctate. Legs piceous or black, tarsi ferruginous. First joint of posterior tarsus as long as the next three. Length .20 inch; 5 mm.

The only sexual difference observed in the male is the more evident frontal tubercles.

This species may be known in the present series by its very black color, the subopaque elytra and the presence of the transverse elevation of the clypeus.

Occurs in California, Washington Territory and Alaska.

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A. ruricola Mels.—Oblong oval, sometimes slightly wider posteriorly, piceous black, shining. Antennæ ferruginous, club darker. Head distinctly trituberculate, sparsely punctate, in front slightly rugulose. Clypeus hemihexagonal, broadly emarginate at middle, the angles on each side obtusely prominent, genæ feebly prominent and very obtuse. Thorax convex, narrower in front, sides feebly arcuate, the hind angles distinct, rather obtuse, base regularly arcuate, punctures of disc moderate, not densely placed, but very regularly disposed. Elytra a little wider than the thorax, humeri obtuse, disc rather deeply striate, striæ rather coarsely crenately punctured, intervals convex, very finely sparsely punctate. Body beneath sparsely punctate. Posterior femora sparsely finely punctate. First joint of posterior tarsus very little longer than the next two. Length .18–.22 inch; 4.5–5.5 mm.

In the males the frontal tubercles are more distinct, the thorax relatively larger and the spur of the anterior tibia rather stouter. In the female the angles of the clypeus on each side of the emargination are more distinct.

In the specimens from the more southern States the form is larger, the elytra less deeply striate, the intervals flatter and more distinctly punctulate. Specimens have been observed with the apices of the elytra somewhat paler in color. The form described by Harold (Berl. Zeitsch. 1863, 375) as *aurelianus* is the larger southern form.

Occurs from Canada and N. E. States to Texas and Colorado.

A. anthracinus Lec.—Oblong, moderately elongate, black, shining, legs brownish. Antennæ ferruginous, the club darker. Head moderately closely punctate in the female, less so in the male, front indistinctly trituberculate, the middle tubercle more prominent in the male. Clypeus hemihexagonal, anteriorly emarginate, more deeply in the male; the angles obtuse, sides oblique, genæ feebly prominent, but obtuse. Thorax convex, larger in the male, narrower in front, sides arcuate, more strongly in the male, hind angles very distinct, but obtuse; base regularly arcuate, disc variably punctured in the sexes, rather densely punctured with intermixed punctures in the female, more sparsely punctured and smoother in the male. Elytra as wide as the thorax, parallel, humeri distinct, but obtuse; disc striate, striæ closely punctured, intervals flat ♀ or slightly convex ♂ and with a row of fine punctures on each side adjacent to the striæ. Body beneath sparsely punctate. Posterior femora sparsely punctate, with a row of coarse punctures parallel with the posterior margin near the knee. First joint of hind tarsus nearly equal to the next three. Length .28–.30 inch; 7–7.5 mm.

In the male the thorax has the sides parallel behind the middle, while in the female the thorax narrows from the base to the apex. The only differences observed between the sexes other than those noted above are found in the stouter anterior tibial spur and the stouter upper spur of the middle tibia.

By some accident, difficult to explain, Dr. LeConte has placed this species in the series with unequal spinules. There can be no doubt,

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however, of its position in the present group. From either *ruricola* or *pectoralis* it may be known by its much larger size and the absence of transverse carina on the clypeus.

Occurs in Utah, American Fork Cañon, at an elevation of 9500 feet.

GROUP C.

Scutellum small. Anterior tibiæ tridentate, feebly or obsoletely crenulate above, the anterior face smooth, the first joint shorter than the second. Posterior tibiæ fimbriate with short equal spinules. Front trituberculate. Mesosternum carinate between the coxæ. Thorax as wide at base as the elytra.

In this series we have but few species, one of them introduced from Europe and become quite cosmopolitan. They are as follows:

First joint of hind tarsus not longer than the next two. Species entirely black. **granarius.**

First joint of hind tarsus equal to next three.

Elytra reddish brown, the suture and side margin piceous; genæ not prominent ..... **vittatus.**

Elytra piceous, maculate with small rufous spots; genæ moderately prominent. **guttatus.**

A. granarius Linn.—Oblong, subcylindrical, piceous, shining, legs reddish brown. Antennæ rufo-testaceous with darker club. Head distinctly trituberculate, the clypeus with a feeble transverse ridge, sparsely punctured at middle, more densely at the sides. Clypeus at middle rather feebly emarginate, on each side broadly rounded, the sides arcuate, the genæ very little prominent, obtuse. Thorax convex, very little narrower in front, the sides arcuate, hind angles distinct, but very obtuse, the basal marginal line fine, but entire; disc variably punctate in the sexes, almost entirely smooth in the male. Elytra parallel, humeri distinct, disc striate, striæ serrately punctured, intervals feebly convex and with few very minute punctures. Body beneath piceous or brown. Mesosternum opaque in front, carinate between the coxæ. Metasternum at sides sparsely punctate, abdomen rugulose and more coarsely punctate at the sides. Posterior femora very sparsely finely punctate. Length .16-.25 inch; 4-6 mm.

Male.—Frontal tubercles very distinct. Thorax larger and more convex, the surface almost smooth, with but few fine punctures sparsely placed. Anterior tibial spur stouter and more arcuate.

Female.—Frontal tubercles less distinct. Thorax smaller, less convex and with sparsely placed coarse punctures more numerous toward the sides.

In this species it will be observed that the first or sutural interval is as wide or even wider than the second, a character not commonly found among the species.

Originally an inhabitant of Europe, this species has been spread by commercial intercourse throughout the world. In our country it has appeared in every locality from which I have received Aphodii.

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A. vittatus Say.—Oblong, subcylindrical, piceous or black, each elytron with a basal and apical rufous spot more or less confluent and rarely with the elytra entirely rufous, except margin and suture, or entirely black; legs reddish brown, the tarsi paler. Antennæ rufous, club darker. Head sparsely punctate and alutaceous, front trituberculate, clypeus subtruncate feebly emarginate, sides arcuate, genæ scarcely prominent. Thorax slightly narrower in front, the sides feebly arcuate, hind angles distinct, but obtuse; basal marginal line distinct, disc moderately convex, surface closely punctate with unequal punctures. Elytra parallel, humeri distinct, disc finely crenately punctato-striate, intervals flat with numerous fine punctures. Body beneath alutaceous, sparsely punctate. Mesosternum opaque in front, carinate between the coxæ. Posterior femora sparsely punctate. Length .14–.20 inch; 3.5–5 mm.

Sexual characters.—The frontal tubercles are more prominent in the male, and the spurs of the anterior tibia somewhat stouter.

As indicated above this species varies in the color of the elytra, from the form with those entirely red except the side margin and suture to others entirely black.

I have seen this species from every region of our country except from California.

A. guttatus Esch.—Oblong oval, feebly convex, shining, piceous brown, spotted with red. Antennæ dark red. Head feebly convex, front trituberculate with an anterior transverse plica sometimes obsolete, surface posteriorly moderately densely punctate, in front rugose. Clypeus truncate, feebly emarginate, the angles rounded, genæ subacute, moderately prominent. Thorax slightly narrowed in front, the sides straight, hind angles obtuse, disc sparsely punctate at middle, more coarsely at the sides, the punctures very unequal. Elytra as broad at base as the thorax, the sides moderately arcuate, the striæ with moderately large punctures, the intervals flat, with fine scattered punctures. Body beneath dark reddish brown. Mesosternum carinate between the coxæ, in front smooth, on each side punctate. Legs brownish red. Anterior tibiæ acutely tridentate, above distinctly crenate. First joint of hind tarsus as long as the next three joints. Length 2.5–3 lines.

This species is unknown to me in nature, and the above description is copied from that of Baron Harold. As remarked by this author the species seems closely related to *congregatus* and *aleutus*. In fact the detailed description given of the red spaces on the elytra is almost exactly that of specimens seen of *congregatus*, and only the positive assertion of Baron Harold that the mesosternum is carinate causes me to believe the two species distinct. It must be rememberd, however, that Erichson (Insect. Deutschl. iii, p. 814) places the species in a series with simple mesosternum.

Occurs in Alaska, Unalaschka.

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Group D.

Scutellum small. Anterior tibiæ tridentate, serrulate or not above, the anterior face smooth, the first joint of the tarsus shorter than the second. Posterior tibiæ fimbriate at apex with equal spinules, the first joint of the tarsus variable. Head distinctly tuberculate. Thorax without basal marginal line.

In this group are associated two species which seem to have but little in common except the absence of basal thoracic line.

First joint of hind tarsus as long as the three following. Anterior tibiæ not serrulate above the teeth; color yellowish testaceous with the posterior portion of the head, a large thoracic spot and the suture of the elytra brown or piceous ..... **lividus.**

First joint of hind tarsus barely as long as the next two. Anterior tibiæ serrate above the teeth; color piceous, the margins and suture paler.. **vestiarius.**

A. lividus Oliv.—Oblong, convex, luteo-testaceous, the posterior portion of the head and a large thoracic spot brown, elytra with the suture brown and a vague cloud on the disc. Antennæ pale testaceous. Head sparsely punctate, front tuberculate. Clypeus paler in color, emarginate at middle, on each side rounded, sides of clypeus slightly oblique. the genæ feebly prominent and obtuse. Thorax convex, slightly narrowed in front, sides arcuate, hind angles distinct, but very obtuse, basal marginal line entirely absent, disc with moderately coarse punctures very sparsely placed, with finer punctures intermixed, less punctate in male than in female. Scutellum with parallel or slightly sinuate sides, the apex obtuse. Elytra parallel, humeri obtuse, disc striate, striæ finely crenately punctate, the intervals very feebly convex with few very minute punctures. Body beneath sparsely, indistinctly punctate. Mesosternum smooth in front, not carinate between the coxæ. Hind femora smooth, stout, very sparsely minutely punctate. Length .18-.20 inch: 4.5-5 mm.

Sexual characters.—These are similar to those of *granarius*, the frontal tubercles are more prominent in the male, especially the middle one, the thorax is relatively larger, more convex and less punctured. The anterior tibial spur is also stouter than in the female, and the upper spur of the middle tibia shorter.

The coloration of this species is a little variable, especially in the size of the dark discal spot of the thorax and the distinctness of the elytral cloud. The head is always bicolored, the frontal suture dividing the pale clypeus from the darker portion posteriorly.

This species is widely distributed in the eastern hemisphere, and has been introduced in the West Indies, whence it has probably spread to our Southern States, extending as far west as New Mexico.

A. vestiarius Horn.—Moderately elongate, convex, piceous, the entire margin of head and body and the suture of the elytra reddish brown, surface shining. Antennæ rufo-testaceous. Head sparsely punctate, front trituberculate. Clypeus subtruncate at middle, very feebly emarginate, the sides feebly arcuate, genæ scarcely prominent, obtuse. Thorax convex, narrower in front, sides ar-

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cuate, hind angles distinct, but very obtuse; basal marginal line entirely wanting, disc sparsely punctate with intermixed punctures. Scutellum of usual triangular form. Elytra parallel, rather deeply striate, striæ indistinctly punctured, but more closely toward the base, intervals convex, with extremely few minute punctures. Body beneath sparsely punctate. Mesosternum in front alutaceous, opaque, between the coxæ subcarinate. Legs brownish testaceous, the posterior femora very sparsely finely punctate. Length .16 inch; 4 mm.

Sexual characters.—These seem to be similar to those above described for *lividus*.

A small inconspicuous species, notable as being one of two in the present series of the genus in the absence of basal marginal line of the thorax, while the other characters are quite different from *lividus*, with which it has been found advisable to associate it.

Occurs in Florida. Four specimens.

Group E.

Scutellum small. Anterior tibiæ tridentate, obsoletely or not crenulate above the teeth, first joint of the tarsus as long as the second. Posterior tibiæ fimbriate at apex with equal spinules, the first tarsal joint not as long as the next three. Head not tuberculate, but roughly punctured. Mesosternum not carinate.

The only species known to me which can enter this group is *A. rugifrons*, notable by its small size and a form of clypeus resembling *denticulatus*.

A. rugifrons Horn.—Oblong, slightly broader posteriorly, piceous shining, elytra variable, often yellow, ornate with black as in *inquinatus*, rarely almost entirely piceous. Legs ferruginous. Antennæ ferruginous, club piceous. Head coarsely, densely and roughly punctured. Clypeus broadly, feebly emarginate on each side a tooth, external to which is an angulation, sides of clypeus oblique, the genæ scarcely prominent and very obtuse. Thorax convex, piceous, the front angles usually paler, slightly wider at base than apex, sides feebly arcuate, hind angles distinct, but very obtuse; base broadly arcuate, basal marginal line fine and indistinct, surface with moderate punctures rather closely placed at the sides, more distant at middle. Elytra as wide as the thorax, a little broader behind the middle, striate, striæ closely punctured, intervals slightly convex, with few scattered punctures. Body beneath sparsely obsoletely punctate. Hind femora sparsely punctate. Length .10–.14 inch; 2.5–3.5 mm.

Sexual characters.—The anterior tibial spur of male is shorter and stouter than in the female; the upper middle tibial spur is also shorter.

The elytra vary much in color. Three specimens have the elytra in great part yellowish with elongate black markings resembling *inquinatus*. The typical specimen is almost entirely piceous with a few indistinct yellowish markings. In the latter individual the thorax is entirely piceous.

Occurs at San Diego, California.

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GROUP F.

Scutellum small. Head convex, without trace of frontal tubercles, the clypeus feebly emarginate. Anterior tibiæ tridentate and crenate externally, the first tarsal joint shorter than the second. Posterior tibiæ fimbriate at apex with short equal spinules, the first tarsal joint but little longer than the next two. Mesosternum not carinate.

This group was originally suggested by Dr. LeConte for *obtusus* (Hayden's Surv. 1878, Bull. iv, 2, p. 454), to which I find it necessary to add three others. Two of these are species formerly placed by me in the series with unequal spinules, partly on account of the poor material then in hand and partly by the judgment of Dr. LeConte, who indicated that position for *subæneus* (Pacif. R. R. Rep. 47 paral. Insects, p. 42). There can be no doubt, however, that the spinules are short, closely placed and as nearly equal among themselves as possible.

The following table will enable the species to be recognized:

Thorax with marginal line at base.
  Marginal line very fine, but entire; general color brownish, elytra dull yellow; thorax sparsely punctate.....**obtusus.**
  Marginal line deep and well marked; head and thorax black, the latter moderately closely and rather coarsely punctate.....**consociatus.**
Thorax with marginal basal line visible at sides only.
  Intervals of elytra sparsely moderately punctate, the second and fourth intervals rugulose and opaque.....**subæneus.**
  Intervals of elytra irregularly biseriately punctate, the punctures nearly as coarse as those of the striæ, intervals not rugulose .....**alternatus.**

These species are all from the region west of the Mississippi, extending from the Rocky Mountains to the Pacific coast.

A. obtusus Lec.--Moderately elongate and convex, brownish, moderately shining, elytra dull yellow or luteous, sides of thorax always paler, femora dull yellow, tibiæ darker. Antennæ entirely pale. Head dark brown, almost piceous the entire margin paler, front not tuberculate, almost smooth at middle closely punctate at sides and in front; clypeus very feebly emarginate, angles obtuse, sides slightly arcuate, genæ moderately prominent, obtuse. Thorax slightly narrowed in front, sides feebly arcuate in front, straight posteriorly, hind angles obtusely rounded, base arcuate with fine distinct marginal line, disc moderately convex, sparsely punctate, a little more closely at the sides, with extremely fine punctures intermixed. Elytra a little wider at base than the thorax, humeri very obtuse, disc feebly striate, striæ closely finely punctate, intervals slightly convex, sparsely punctulate. Body beneath sparsely indistinctly punctate. Mesosternum coarsely punctate, a median oval opaque space divided by a fine groove. Anterior tibiæ smooth in front, tridentate externally and crenulate above, the first tarsal joint shorter than the second. Posterior femora very sparsely punctate, the first tarsal joint shorter than the next three. Length .24-.26 inch; .6-6.5 mm.

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The two specimens before me are females and have the anterior tibial spur slender, acute and slightly arcuate.

From Colorado without definite locality, and from Como, Wyoming. Probably a species of high altitudes.

A. consociatus n. sp.—Moderately elongate and convex, parallel, black, shining, legs brownish, elytra dull yellow, the sutural interval and lateral space piceous. Antennæ testaceous, club fuscous. Head coarsely and deeply punctured at the sides, the middle very convex and less punctate, front not tuberculate: clypeus somewhat retuse in front, the anterior margin scarcely emarginate, the angles rounded, the sides arcuate, genæ feebly prominent and obtuse. Thorax nearly twice as wide as long, the sides nearly straight and parallel, arcuate in front, hind angles obtusely rounded, base arcuate, the marginal line very distinct; disc convex, the punctures coarse and moderately closely placed over the entire surface, a little denser and coarser at the sides. Elytra as wide at base as the thorax, humeri very distinct, sides parallel, less striate, striæ with moderately coarse and close, but not deep punctures, intervals very flat, finely alutaceous, irregularly biseriately, indistinctly punctate; color dull yellow with the sutural interval and a lateral posthumeral stripe piceous, sometimes the intervals 3–5–7 are darker. Body beneath alutaceous, sparsely punctate. Mesosternum not carinate, coarsely punctate, an oval median opaque alutaceous space. Anterior tibiæ smooth in front, tridentate externally, crenate above, the first tarsal joint shorter than the second. Posterior femora sparsely punctate, the first tarsal joint nearly as long as the next three. Length .20 inch; 5 mm.

Male.—Spur of anterior tibia stout, falciform, but feebly curved.

Female.—Spur of anterior tibia slender, acute, slightly arcuate.

The majority of the specimens have the suture piceous and the lateral stripe broad beginning at the humerus and extending posteriorly, contiguous to the lateral margin, except near its end. There is one specimen before me with the third, fifth and seventh intervals darker, and it is probable that specimens will occur entirely black.

It is highly probable that this species is mistaken for *subæneus* or *alternatus* in most collections, from either of which it may be known by the entire basal marginal line.

Occurs in California, the precise region unknown, but probably from the south.

A. subæneus Lec.—Oblong, convex, black with distinct æneous lustre, elytra dull yellow, irregularly striped with piceous, rarely entirely black, legs rufo-piceous. Antennæ rufo-testaceous, club piceous. Head convex, without tubercles, coarsely punctate, densely at the sides. Clypeus broadly and feebly emarginate, obtuse. Thorax feebly narrowed in front, the sides nearly straight, slightly arcuate in front, hind angles nearly rectangular, but slightly obtuse at apex, base arcuate, with the marginal line distinct for a short distance near the angles, disc convex, moderately punctate, the punctures close but not dense and equally dispersed over the entire surface usually with a smooth median line. Elytra as wide at base as the thorax, humeri obtuse, disc finely striate, striæ

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finely and closely punctate, intervals flat, irregularly biseriately punctulate, the second and fourth intervals often wrinkled and opaque. Metasternum at sides coarsely punctate, abdomen alutaceous, indistinctly punctate. Mesosternum very coarsely punctate, rather shining, without opaque space and not carinate. Anterior tibiæ smooth in front, tridentate externally and crenulate above, the first tarsal joint a little shorter than the second. Posterior femora sparsely punctate, the first tarsal joint scarcely longer than the next two. Length .18-.20 inch; 4.5-5 mm.

Male.—Anterior tibial spur stout, falciform, acute at tip.
Female.—Anterior tibial spur slender and slightly arcuate.

The elytra are variable in color. Usually they are in great part dull yellow with the suture and a broad lateral stripe piceous as in *consociatus*, but the alternate intervals 1-3-5-7 may be piceous, united at their base and apex, rarely the entire elytra are entirely black. The apices of the elytra are distinctly alutaceous and in the paler specimens the side margin posteriorly and apex have a reddish appearance. Specimens rarely occur with the head much less conspicuously punctured, in fact comparatively smooth, this is independent of sex, although the females are generally rougher.

Two specimens from Washington Territory are before me with the intervals 2 and 4 not wrinked and opaque, those may represent another species as there are other slight differences, but with such a close resemblance to the others I am unwilling to separate them with so little material.

Occurs in California (and ? Washington Territory).

A. alternatus Horn.—Moderately elongate and convex, parallel, black, shining, legs brownish or piceous, elytra variable, usually with intervals alternately dull yellow and piceous. Antennæ rufous, club darker. Head moderately convex, front not tuberculate, sparsely rather finely punctate; clypeus broadly and feebly emarginate at middle, the angles broadly rounded, sides oblique slightly sinuate posteriorly, genæ moderately prominent, but obtuse. Thorax nearly twice as wide as long, slightly narrower in front, sides very feebly arcuate, hind angles obtuse, base arcuate, the marginal line distinct only at the sides; disc finely not closely punctate, regularly disposed and very little coarser near the sides. Elytra as wide at base as the thorax, humeri obtuse, disc striate, the punctures moderately coarse and close, intervals flat, irregularly biseriately, moderately coarsely punctate, intervals not alutaceous. Body sparsely indistinctly punctate beneath. Mesosternum coarsely punctate, often with a broad smooth space at middle. Anterior tibiæ smooth in front, tridentate externally and serrulate above, the first tarsal joint shorter than the second. Posterior femora sparsely punctate, the first tarsal joint not as long as the next three. Length .18-.23 inch; 4.5-6 mm.

Male.—Anterior tibial spur stout, straight, curved and acute at tip.
Female.—Anterior tibial spur slender, slightly curved, acute at tip.

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In this species as in *subæneus*, the elytra vary in coloration. In those in which the elytra are bicolored the side margin posteriorly and the apex are somewhat reddish. The typical form has the alternate intervals 1–3–5–7 piceous, and a broad lateral space of the same color, from this the elytra may become totally black as in a small series from Arizona, some of which were of the usual vittate form, the others black. In the black forms the mesosternum is more punctured and the median smooth space less evident.

Occurs at Fort Yuma, Cal., eastward through Arizona, north to Colorado and the Bitter Root Valley of Montana.

Group G.

Scutellum small. Anterior tibiæ tridentate, not serrulate above, the anterior face smooth, the tarsi with first four joints equal in length. Posterior tibiæ fimbriate with equal spinules. Head not tuberculate. Thorax narrowed at base and with entire marginal line. Elytra oval, the humeri dentiform. Mesosternum carinate between the coxæ.

The narrowing of the thorax behind and the elytra narrowed at base with dentiform humeri, give the species a facies almost peculiar to them, and the thorax and elytra seem more distant at their bases than in the vast majority of species.

The following species are at present known:

Clypeus distinctly dentate each side of the emargination.
  First joint of hind tarsus not as long as the next three; punctuation of thorax intermixed..... **nevadensis.**
Clypeus angulate not dentate each side of the emargination.
  First joint of hind tarsus as long as the next three; punctuation of thorax coarse, irregularly scattered, not intermixed..... **gentilis.**
Clypeus feebly emarginate at middle, broadly rounded each side, genæ not prominent.
  First joint of hind tarsus as long as the next three; punctuation of thorax as in *gentilis*..... **cribratus.**

A. nevadensis Horn.—Oblong, piceous or black, brown when immature, shining. Antennæ brown. Head not tuberculate, surface rugose, especially in front and at the sides. Clypeus slightly impressed in front, broadly not deeply emarginate, on each side denticulate, the sides arcuate, genæ moderately prominent and subacute. Thorax broad, widest slightly in front of middle, sides arcuate, narrowing to base, hind angles broadly rounded, base arcuate, basal marginal line deep; disc convex, sparsely punctate with coarse and fine punctures intermixed. Elytra oblong oval, slightly narrowed at base, the humeri slightly dentiform, disc convex, moderately deeply striate, striæ moderately coarsely and closely punctate, intervals feebly convex, sparsely punctulate. Body beneath

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sparsely punctate, usually a little paler in color than above. Mesosternum coarsely punctured in front, obtusely carinate between the coxæ. Posterior femora sparsely coarsely punctate. Wings feebly developed. Length .22-.30 inch; 5.5–7.5 mm.

Sexual characters.—The only differences observed in the ten specimens before me are that the males have the anterior tibial spur stouter and more curved, and the upper spur of the middle tibiæ is less than half the length of the lower spur.

Occurs in Nevada and the extreme north of California.

A. gentilis n. sp.—Oblong, black, shining. Antennæ brown. Head not tuberculate, granulate punctate at front and sides. Clypeus impressed and emarginate at middle, on each side angulate, sides of clypeus arcuate, genæ prominent and acute. Thorax broad, convex, narrower at base, sides arcuate, broadest at middle, hind angles broadly rounded, basal marginal line deep, surface with very coarse and deep punctures sparsely and irregularly placed. Elytra oval, a little narrowed at base, humeri slightly dentiform, surface striate, striæ not closely punctate, intervals very slightly convex, with few extremely minute punctures. Mesosternum moderately densely punctured in front, carinate between the coxæ. Body beneath sparsely punctured, the sides of the abdomen rugulose. Posterior femora smooth, with three or four punctures in a row near the knee. Length .28 inch; 7 mm.

Of this species I have seen but one female specimen. It is closely related to *nevadensis*, and differs from that, in addition to the characters given in the table, in the more prominent and acute genæ.

One specimen, San Francisco, Cal.

A. cribratus Lec.—Oblong, piceous black or brown, smooth, shining. Antennæ ferruginous. Head not tuberculate, sparsely punctate and slightly rugose at the sides and in front. Clypeus broadly and feebly emarginate at middle, rounded each side, genæ scarcely prominent. Thorax broad, narrowed at base, sides arcuate, hind angles broadly rounded, basal marginal line deep, disc convex with coarse and deep punctures sparsely and irregularly placed. Elytra oblong oval, slightly narrowed at base, the humeri slightly dentiform, the striæ deep, rather coarsely and closely, sometimes crenately punctured, intervals convex, smooth. Mesosternum in front coarsely closely punctate, between the coxæ obtusely carinate. Metasternum and abdomen at their sides coarsely punctured and rugulose. Hind femora sparsely punctate or smooth. Length .18–.28 inch; 4.5–7 mm.

The only sexual characters observed in the male are a thicker and more arcuate spur to the anterior tibia and the upper spur of the middle tibia is shorter than half the lower.

Five specimens, California (north) and Oregon.

To this group should probably be referred the following species:

Oxyomus cadaverinus Mann., Bull. Mosc. 1843, ii, p. 261.—Oblongus, supra nigro-subtus rufo-piceous, clypeo profunde emarginato, thorace anterius dilatato varioloso, elytris punctato-striatis. Longit. 3 lin. Latit. 1¾ lin.

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From the above very inadequate description it is impossible to assign the species a place. I was at one time disposed to consider the species described further on as *ovipennis* synonymous, but at present it would be certainly unwise to consider either that or any one of the present group identical with it.

Group H.

Scutellum small. Front convex, with at most very feeble traces of tubercles. Anterior tibiæ normally tridentate, either obsoletely or not at all serrulate above, the first joint of anterior tarsi as long or longer than the second in all except *stupidus*. Posterior tibiæ fimbriate at apex with unequal spinules, the first joint of the tarsus variable. Mesosternum simple or finely carinate in *lentus*.

This group seems to be the most homogeneous of the present series. The species are all more or less opaque, usually extremely finely pubescent, the thorax always densely punctured; they may be distinguished in the following manner:

Elytral intervals flat, the striæ finely or not punctured.
  Mesosternum not carinate; color black or piceous.
    Elytral intervals without punctures or roughness, striæ without punctures. **opacus.**
    Elytral intervals punctate and often submuricate.
      Clypeus on each side distinctly angulate; first joint of posterior tarsus long..... **lutulentus.**
      Clypeus on each side rounded; first joint of posterior tarsus not longer than the next two..... **stupidus.**
  Mesosternum finely carinate between the coxæ.
    Species small, ferruginous..... **lentus.**
Elytral intervals very convex, the striæ broad, with coarse, distant punctures; mesosternum not carinate..... **decipiens.**

Specimens of *lutulentus* occur with no angulation of the clypeus, in this case the structure of the anterior and posterior tarsi, the larger size and more prolonged elytra will distinguish them.

A. opacus Lec.—Oblong, moderately robust, black, opaque, a very narrow sutural space shining. Antennæ ferruginous, club darker. Head moderately convex, finely and rather densely punctured, front not tuberculate. Clypeus emarginate at middle, the angles on each side well marked, but obtuse; sides arcuate, genæ moderately prominent, but obtuse. Thorax convex, sides parallel posteriorly arcuate in front, hind angles scarcely distinct, surface rather densely and finely punctured except along the median line. Elytra not wider than the thorax, humeri finely dentate, disc moderately deeply striate, the striæ not distinctly punctured, intervals very flat and opaque without trace of punctures or tubercles. Body beneath coarsely, but not deeply punctured, the abdomen very

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indistinctly so, the surface alutaceous. Posterior femora coarsely and rather closely punctate. Tarsi brownish, the first joint of the posterior tarsi as long or longer than the next three. Length .22–.24 inch; 5.5–6 mm.

Of this species I have seen but two specimens only one of which is now before me, it shows no sexual characters.

The spinules of the apex of the hind tibiæ are very plainly unequal. The mesosternum is coarsely punctured in front, not carinate between the coxæ.

This species resembles *lutulentus* in form, but is more obtuse posteriorly.

Occurs in California and Vancouver.

A. lutulentus Hald.—Oblong, moderately elongate, black, subopaque. Antennæ ferruginous, club piceous. Head densely punctulate with feeble traces of frontal tubercles in the male. Clypeus broadly but feebly emarginate at middle, strongly angulate or subdentate each side, sides of clypeus arcuate with a distinct sinuation at the end of the frontal suture, genæ prominent, but obtuse. Thorax convex, gradually narrower to front ♀ or with the sides parallel and arcuate near the front angles ♂, hind angles very obtuse, base arcuate, but slightly sinuous, disc convex, feebly shining ♂ or opaque ♀, the punctures rather fine, very dense over the entire surface ♀ or sparser at middle ♂. Elytra not wider than the thorax, oblong oval gradually narrowed to apex, humeri slightly dentiform, disc striate, striæ punctured, intervals flat opaque, longitudinally strigose with moderately coarse punctures which are often submuricate or granular. Body beneath more shining than above, sparsely punctate. Mesosternum opaque and strigose, not carinate between the coxæ. Hind femora coarsely sparsely punctate. First joint of hind tarsus not longer than the next two. Length .22–.28 inch; 5.5–7 mm.

Male.—Spur of anterior tibia very long, equalling the first four tarsal joints. Upper spur of middle tibia very short and obtuse. Posterior edge of hind femora very broadly and obtusely angulate, the posterior tibiæ rather broad and thin, the lower face smooth the transverse ridges very feeble, one only being at all indicated.

Female.—Anterior tibial spur of normal size. The posterior femora of normal form, the tibiæ rather slender, the ridges indicated, but feeble.

The females are of smaller size and more opaque than the males, the thorax more narrowed in front and more densely punctured. In this sex I have observed specimens without the emargination of the clypeus and consequently without trace of angulation, but these may be distinguished from *stupidus* by their larger size and the more prolonged elytra.

At the time of my former synopsis this was one of our rarest species and the female was apparently the only sex known and for this reason the curious male characters escaped observation.

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In very well preserved fresh specimens the surface is sparsely clothed with very short almost microscopic pubescence, no special mention is made of it in the description as by far the larger number of specimens are entirely deprived of pubescence.

A. stupidus Horn.—Oblong moderately robust, piceous or black, subopaque, sparsely pubescent, legs rufopiceous. Antennæ, including club, rufotestaceous. Head moderately densely punctate, smoother in front and at the sides, a single very feeble frontal tubercle. Clypeus hemihexagonal, apex very feebly emarginate, on each side rounded, sides oblique slightly sinuate, the genæ feebly prominent obtuse. Thorax convex, sides posteriorly parallel or very feebly arcuate, hind angles distinct, but obtuse; base regularly arcuate, surface moderately finely and densely punctate and alutaceous. Elytra not wider than the thorax, humeri obtuse, color black or piceous, sometimes with the humeri and apex faintly rufous, disc striate, striæ coarsely punctured, intervals flat, subbiseriately coarsely punctate, the punctures often submuricate. Body beneath sparsely punctate, the abdomen smoother and more shining. Posterior femora sparsely punctate, the first joint of posterior tarsus not longer than the next two. Length .16–.20 inch; 4–5 mm.

No sexual characters have been observed in the specimens before me. Several are more shining than the others and thorax larger or at least, less narrowed in front. These are probably males. The specimen, observed at the time of my former revision, in which the elytra were apparently sinuate near the apex is not now before me, but in the six specimens now at hand, in which I am reasonably sure both sexes are present no such character has been seen.

In this species the pubescence seems to be more persistent than in *lutulentus*, both on the thorax and elytra, it is, however, extremely short and inconspicuous.

Occurs in North Carolina and Georgia.

A. lentus Horn.—Elongate oval, feebly convex, ferruginous brown, head and thorax slightly darker, surface feebly shining, slightly pubescent. Antennæ ferruginous. Head convex without trace of frontal tubercles, moderately closely punctate and finely alutaceous, smoother in front and near the side. Clypeus hemihexagonal, scarcely emarginate in front, the angles broadly rounded, sides oblique, genæ scarcely prominent beyond the eyes. Thorax convex, slightly narrower in front, sides feebly arcuate, hind angles well defined, but obtuse; base arcuate, disc moderately densely punctate, somewhat smooth at middle. Elytra not wider than the thorax, humeri obtuse, disc striate, striæ rather coarsely punctured, intervals slightly convex, irregularly biseriately punctate, the punctures nearly as coarse as those of the striæ. Body beneath sparsely indistinctly punctate. Posterior femora sparsely finely punctate, first joint of hind tarsi as long as the next three. Mesosternum opaque, finely carinate between the coxæ. Length .14–.16 inch; 3.5–4 mm.

In the five specimens before me no sexual differences have been observed.

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This species by the form of the elytra resembles a diminutive pale *lutulentus*. The pubescence is a little more conspicuous and less erect than is the preceding species.

Occurs in Pennsylvania, Georgia, Illinois and Massachusetts (Lowell, Blanchard).

A. decipiens n. sp.—Moderately elongate, parallel, ferruginous brown, opaque. Antennæ rufo-testaceous with darker club. Head moderately convex, finely and rather closely but very indistinctly punctate, front without trace of tubercles. Clypeus impressed in front, broadly emarginate at middle, subangulate each side, sides arcuate, genæ feebly prominent and obtuse. Thorax nearly twice as wide as long, not narrowed in front, sides feebly arcuate, hind angles distinct, but obtuse; base regularly arcuate; the marginal line rather broad, disc moderately convex, the punctures very coarse, but not deep; closely placed posteriorly and at sides, finer near the front, the intervals between the punctures somewhat rugose. Elytra as wide at base as the thorax, humeri distinct, slightly dentiform, sides nearly parallel, striæ broad and deep with coarse but indistinct punctures not closely placed, the intervals convex, very little wider than the striæ. Mesosternum not carinate, opaque finely alutaceous. Metasternum coarsely but not deeply punctured. Abdomen obsoletely scabrous, not punctate. Anterior tibiæ tridentate externally, not crenate above, the first joint of the tarsus as long as the second. Posterior femora coarsely punctured, the first tarsal joint as long as the next three. Length .14 inch; 3.5 mm.

This species by its general appearance is more related to the opaque species of Atænius than to any species of Aphodius known to me, and it is placed in the latter genus after a study made when the preliminary work on the other genera had been completed. The posterior tibiæ are certainly without the apical prolongation and the transverse ridges though present are feeble. The mandibles have not been examined, as this would require a dissection of the unique.

One specimen, western Nevada (Morrison).

Group I.

Scutellum small. Posterior tibiæ fimbriate at apex with unequal spinules. Front never very roughly sculptured, tuberculate or not, clypeus never with a transverse ridge. Surface of body smooth and shining without trace of pubescence.

The other characters of the group are variable. The species here included are more than a third of the entire number known in our fauna, and while the characters seem hardly of sufficient moment to divide them into groups they may be separated into series some of which at present seem natural and homogeneous, others are purely artificial.

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In my present studies I have been unable to follow the method proposed by Erichson, of separating the species with and those without frontal tubercles into separate groups. Unfortunately our species are too variable. We have a certain number with well marked frontal tubercles which are more pronounced in the males, while males of other species have the tubercles as feeble as those of the females noted and their females may not be at all tuberculate. The present group is therefore the equivalent of groups I and L of my former paper (Trans. Am. Ent. Soc. 1870).

In order that the species may be more readily handled and the synoptic table rendered less unwieldly I proposed to divide the group into the following series:

Side margin of thorax explanate, usually a concavity near the hind angle. Series **I-a**

Side margin of thorax not explanate.....2.

2.—Mesosternum distinctly carinate between the coxæ. Thorax without basal line. Front tibiæ punctate on anterior face, the first tarsal joint longer than the second.....Series **I-b**

Mesosternum not carinate. Anterior tibiæ smooth in front.....3.

3.—Species entirely ferruginous, luteous or rufo-testaceous, never in any part black.....Series **I-c**

Species in great part piceous, head and thorax always black or piceous, although at times with the sides pale. Elytra variable in color, either black, dull red or yellow maculate.....Series **I-d**

The first two series might form fairly natural groups while the other two are rather heterogeneous, but any attempt to further divide them would result in more confusion than benefit.

Series I-a.

Front not at all or only feebly tuberculate. Side of thorax explanate, the margin usually slightly reflexed, the basal marginal line wanting or very fine. Anterior tibiæ smooth in front. Mesosternum not carinate, except in *explanatus*.

The species of this series are all moderately large and belong to the region of our country west of the Mississippi River and east of the Sierra Nevada Mountains.

They may be distinguished in the following manner:

Mesosternum distinctly carinate between the coxæ; clypeus angulate each side of the emargination; thorax closely and equally punctured; sides of thorax and elytra dull red, the intervals punctulate...**explanatus.**

Mesosternum not carinate.....2.

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2.—Clypeus distinctly denticulate each side of the emargination, the sides strongly arcuate.....**rudis.**

Clypeus angulate each side of emargination the sides oblique; no depression near hind angles of thorax.....**phæopterus.**

Clypeus feebly emarginate at middle, on each side broadly rounded.....3.

3.—Color piceous, the elytra in one species reddish yellow.

Striæ of elytra moderately deep, intervals convex, not punctulate; entirely piceous.....**brevicollis.**

Striæ moderately deep, intervals convex and distinctly punctulate. **marginatus.**

Striæ fine, scarcely punctulate, intervals nearly flat, finely and densely punctulate; elytra reddish yellow.....**ochreipennis.**

Color entirely rufo-ferruginous; surface polished, the sculpture very feeble; striæ of elytra fine and very finely punctulate; intervals flat and smooth .....**Haldemani.**

A. explanatus Lec.—Elongate, moderately convex, piceous shining, the sides of the head, sides of thorax broadly and base narrowly, elytra and legs dull rufo-testaceous. Antennæ rufo-testaceous, the club somewhat darker. Head moderately convex, finely and moderately closely punctured, front feebly trituberculate. Clypeus broadly but not deeply emarginate at middle, the angles on each side prominent, subacute and slightly reflexed, the sides oblique, genæ moderately prominent but obtuse. Thorax nearly twice as wide as long, narrower in front, the sides broadly explanate and slightly reflexed, arcuate from the hind angles which are very broadly rounded, base arcuate, slightly sinuate each side of middle, a distinct but very fine marginal line; disc moderately convex, a slight median longitudinal impression near the base, the punctures moderate in size, closely placed, somewhat coarser and denser near the sides. Elytra slightly narrower at base than the thorax, humeri obtuse, sides slightly arcuate behind the middle, disc striate, striæ finely and closely punctured, intervals moderately convex and with very numerous punctures irregularly placed. Body beneath moderately finely not closely punctate. Abdomen more closely and coarsely punctate, sparsely pubescent. Mesosternum opaque at middle and alutaceous, at sides punctate, very distinctly carinate between the coxæ. Anterior tibiæ smooth in front, tridentate externally and obsoletely crenate above, the first tarsal joint nearly as long as the second. Posterior femora sparsely punctate, a few coarse punctures in line near the knee, the first tarsal joint as long as the next three. Length .34 inch; 8.5 mm.

The only specimen seen is a female, the spur of the anterior tibia is slender and acute.

This species is remarkable for its size and style of coloration. It is the only one in the present series with the sides of the piceous thorax conspicuously paler in color, otherwise it resembles *ochreipennis*, this being the only one for which it might be mistaken. The presence of a very well elevated carina between the middle coxæ is a character that would not be expected in this series, and this with the explanate and closely evenly punctured thorax make it one of the most easily to be recognized species in our fauna.

Occurs in Colorado, collected by Prof. F. H. Snow.

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A. rudis Lec.—Moderately elongate and convex, dark chestnut brown, shining. Antennæ pale brownish testaceous. Head sparsely punctate at the sides, smoother at middle, front not tuberculate; clypeus broadly but feebly emarginate with a dentiform angulation each side, sides arcuate, slightly smooth, with short fimbriæ, the genæ prominent and subacute. Thorax twice as wide as long, not narrowed in front, the sides very feebly arcuate, the margin explanate, hind angles obtuse, base arcuate at middle, sinuate each side near the hind angles, without trace of basal marginal line; disc moderately convex, with extremely fine and sparse punctures and with numerous large but shallow punctures over the entire surface except in a transverse space one-fourth from apex, and along the median line. Elytra a little narrower at base than the thorax, slightly wider behind, finely striate, striæ with fine close punctures, intervals flat, very minutely punctulate. Body beneath sparsely indistinctly punctate. Mesosternum not carinate. Anterior tibiæ tridentate and indistinctly crenulate above, the anterior face smooth; the first joint of tarsus shorter than the second. Posterior femora sparsely punctate, the first joint of the tarsus as long as the next three. Length .26 inch; 6.5 mm.

The specimen before me is probably a female, it shows no sexual characters.

In the original description of this species Dr. LeConte was disposed to place the species with *ovipennis* and others in which the thorax is distinctly narrowed posteriorly and the sides sinuate in front of the hind angles. These two characters do not exist in the present species, and the explanate sides of the thorax suggest its relationship. The depression of the thorax near the hind angles so well marked in most of the explanate species is not very evident here.

Occurs in Colorado.

A. phæopterus Lec.—Oblong, moderately convex, piceous, shining, sides of head and thorax sometimes the elytra paler, legs brownish. Antennæ rufo-testaceous, club somewhat darker. Head moderately convex, sparsely punctulate, without frontal tubercles, but with a slight tuberosity each side; clypeus convex at middle, apex broadly but feebly emarginate, the angles each side distinct, but not dentiform, sides oblique slightly arcuate, genæ moderately prominent, but obtuse. Thorax nearly twice as wide as long, the sides parallel posteriorly, arcuate in front, margin narrowly explanate, more widely in front, without depression near the hind angles, these distinct, but obtuse; base regularly arcuate, with an extremely feeble trace of a marginal line, disc convex with moderately coarse punctures not densely placed along the sides and base, with finer punctures intermixed and in the antero-median space. Elytra a little narrower at base than the thorax, slightly wider posteriorly, humeri distinct, disc rather deeply striate, striæ closely finely punctate, intervals convex finely punctulate, more distinctly near the apex. Body beneath sparsely punctate. Mesosternum not carinate. Anterior tibiæ smooth in front, tridentate externally and crenulate above, the first joint of the tarsus much shorter than the second. Posterior femora sparsely punctate, the first joint of the tarsus very nearly as long as the next three. Length .28 inch; 7 mm.

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Male.—Upper spur of middle tibia short, stout, abruptly bent at apex. Middle and posterior femora more punctate along the posterior edge and slightly hairy.

Female.—Upper spur slender. Femora not pilose.

This species has been compared by Dr. LeConte with *cruentatus*, with which it seems to have much less in common than with *marginatus*. The latter is more dilated posteriorly, the thorax more widely margined with a distinct concavity in the hind angles of the thorax. In *phæopterus* the angles on each side of the emargination of the genæ are well marked, while in *marginatus* they are broadly rounded.

Occurs in Washington Territory, Idaho and Montana.

A. brevicollis Lec.—Oblong, moderately elongate and convex, piceous, shining, legs brownish testaceous. Antennæ rufo-testaceous. Head piceous, the margin reddish brown, surface punctulate, sparsely at middle, more coarsely near the sides, front with a slight tuberosity each side: clypeus broadly emarginate, the angles on each side rounded, sides arcuate, feebly sinuate, genæ prominent, but obtuse. Thorax more than twice as wide as long, slightly narrowed in front, the sides slightly undulating, the lateral margin rather widely explanate and broader posteriorly, a distinct concavity near the hind angles, these very obtuse, base feebly arcuate without marginal line; disc moderately convex, piceous, the margins paler, surface smooth with very large punctures placed distantly near the sides. Elytra narrower at base than the thorax, slightly wider posteriorly, humeri obtuse, surface rather deeply striate, striæ closely not coarsely punctured, intervals slightly convex, smooth. Body beneath sparsely and indistinctly punctate. Mesosternum not carinate. Anterior tibiæ strongly tridentate, not crenate above, anterior face smooth, the tarsus with first joint shorter than the second. Posterior femora smooth, the first joint of tarsus not as long as the next three. Length .32 inch; 8 mm.

The unique before me, which is the type, shows no special sexual characters.

The characters given in the table will readily distinguish it from the species at present known.

Occurs in Nebraska; one specimen kindly given me by Mr. H. Ulke.

A. marginatus Lec.—Moderately elongate and convex, somewhat broader posteriorly, black or piceous, elytra and legs very dark brown. Antennæ pale brown. Head moderately convex, front without tubercles, but with a slight tuberosity each side, surface punctulate with somewhat coarser punctures near the side; clypeus very feebly and broadly emarginate, the angles very obtuse, the sides oblique, genæ moderately prominent, but obtuse. Thorax more than twice as wide as long, a little narrower in front, sides very feebly arcuate, the margin rather broadly explanate with a well marked depression near the hind angles, these very obtuse, base feebly arcuate without marginal line; disc moderately convex, with numerous but not closely placed fine punctures and with very many large punctures which are closely placed near the hind angles and

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almost absent in a large space behind the middle of the apical margin. Elytra a little narrower at base than the thorax, gradually wider posteriorly, humeri very obtuse, disc striate, the striæ deep closely but finely punctured, intervals convex and finely punctulate. Body beneath sparsely indistinctly punctate. Mesosternum not carinate. Anterior tibiæ smooth in front, strongly tridentate, externally, but not crenate above, the first tarsal joint shorter than the second. Posterior femora very sparsely punctate, first tarsal joint not as long as the next three. Length .30–.32 inch; 7.5–8 mm

The two specimens before me show no sexual differences, they are probably females.

This species resembles *brevicollis* very closely in form and general appearance, and the two differ especially in the different punctuation of the thorax and elytra.

Occurs in eastern Nevada; two specimens.

A. ochreipennis Horn.—Moderately elongate and convex, piceous nearly black, lateral margin of head and thorax paler, elytra reddish yellow, legs brown. Antennæ paler. Head convex, without trace of any elevations, surface sparsely, very finely punctulate; clypeus very broadly and feebly emarginate, broadly rounded each side, the sides arcuate, genæ moderately prominent, but obtuse. Thorax nearly twice as wide as long, sides moderately arcuate, margin explanate, a rather deep depression near the hind angles, these very indistinct, base arcuate at middle, obliquely sinuate each side, without trace of marginal line; disc convex with numerous, but not densely placed fine punctures, and with very coarse punctures near the base and sides, densely placed in the angular concavity. Elytra narrower at base than the thorax, slightly wider posteriorly, humeri very obtuse, disc finely striate, striæ with very fine punctures, intervals nearly flat and with numerous fine punctures. Body beneath coarsely punctured at the sides, abdomen more sparsely punctured. Mesosternum not carinate. Anterior tibiæ smooth in front, tridentate externally, but not crenulate above. Posterior femora sparsely punctate. Length .26 inch; 6.5 mm.

One specimen, probably a female, without anterior or posterior tarsi has been seen.

A very distinct species among those with explanate thorax by the very oblique sinuation of the base of the thorax near the hind angles so that the angles are obliterated, and when the thorax is viewed from above it seems to be narrower at base than apex. The color of the elytra is paler than the other species with a piceous body color, but this is a character of secondary importance.

One specimen, Owen's Valley, California.

A. Haldemani (*politus* || Horn).—Oblong, moderately convex, rufo-testaceous, shining. Antennæ pale. Head moderately convex, smooth shining, without trace of frontal tubercles or punctures; clypeus broadly but feebly emarginate, angles on each side broadly rounded, sides slightly sinuate, the genæ moderately prominent, but obtuse. Thorax transverse, scarcely narrowed in

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front, the sides feebly arcuate, the hind angles broadly rounded, base feebly arcuate, lateral margin narrowly explanate, more broadly near the hind angles where there is a broad, but shallow depression; disc moderately convex, smooth and shining, a few coarse, but shallow punctures opposite the base of each elytron and others in the depression and close to the side margin. Elytra a little narrower at base than the thorax, humeri very obtuse, disc very finely striate, the striæ scarcely visible at the sides; striæ very finely and rather closely punctured, intervals flat and polished. Mesosternum not carinate. Body beneath sparsely punctate, shining. Posterior femora with a row of coarse punctures near the knee; first joint of hind tarsus as long as the next three. First joint of anterior tarsus shorter than the second, the tibia smooth in front and not serrulate above the teeth. Length .32 inch; 8 mm.

Male.—Spur of anterior tibia elongate triangular, broader and truncate at tip. Middle and posterior femora ciliate at basal half of posterior margin.

Female.—Spur of anterior tibia stout, curved and acute at tip. Femora not fimbriate. Thorax with more numerous and convex punctures at the sides.

This species is notable for its size, color and highly polished surface. I have changed the name as Mulsant had used the same for another species, the description of which appeared a few months earlier the same year.

Occurs in Texas and Kansas.

Series **I-b.**

Front not tuberculate. Thorax at sides not explanate, without basal marginal line, Mesosternum distinctly carinate between the coxæ. Anterior tibiæ punctate in front, the first tarsal joint longer than the second.

The last two characters together are not known in any other species in our fauna. At present but two species are known, they closely resemble each other superficially, but may be separated in the following manner:

Posterior tibiæ stout; first joint of posterior tarsus not as long as the next three. **rubeolus.**

Posterior tibiæ slender; first joint of posterior tarsus longer than the next three. **stercorosus.**

These belong to the fauna of the Atlantic region, and the second seems more widely spread and common.

A. rubeolus Beauv.—Form moderately elongate and convex, rufo-ferruginous or pale castaneous, shining. Antennæ rufo-testaceous. Head convex, sparsely finely punctate, front not tuberculate; clypeus feebly emarginate at middle, the angles each side obtuse, the sides arcuate, the angles each side obtuse, the sides arcuate, genæ scarcely more prominent than the eyes. Thorax slightly narrowed in front, sides feebly arcuate, hind angles very obtusely rounded, base broadly arcuate without marginal line, disc convex, at middle very sparsely finely

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punctate, near the sides the punctures more numerous and larger. Elytra a little wider than the thorax, subparallel, finely striate, striæ finely or obsoletely punctulate, intervals flat and smooth. Body beneath very sparsely punctate and alutaceous. Mesosternum distinctly carinate between the coxæ, opaque and alutaceous in front. Anterior tibiæ punctate on the anterior face, tridentate externally and serrate above; first joint of front tarsus much longer than the second. Posterior tibiæ stout, the first joint of hind tarsus not as long as the next three. Length .14–.20 inch; 3.5–5 mm.

In the comparatively few specimens examined I have observed no sexual differences.

Closely related to the next species, but easily known by the much stouter hind tibiæ and the shorter first hind tarsal joint. The punctuation of the striæ formerly regarded by me as of some value in separating the two species, is shown by the increase of material to be too variable a character to be depended upon.

Occurs from the Middle States to Missouri and Texas, also rarely in Massachusetts (Blanchard).

A. stercorosus Mels.—Form oblong, parallel, convex, rufo-testaceous, head and thorax darker, elytra often clouded, surface smooth, shining. Antennæ rufo-testaceous. Head convex, front not tuberculate, surface sparsely punctate ♀ or scarcely visibly punctate ♂. Clypeus truncate, very feebly emarginate, the sides arcuate, the genæ scarcely more prominent than the eyes. Thorax slightly narrowed in front, sides feebly arcuate, the hind angles distinct, but obtuse; base arcuate, without marginal line, disc convex, very sparsely punctate at middle, more coarsely toward the sides, the thorax of ♀ more coarsely punctate than the male. Elytra finely striate, very finely punctate ♂ or more distinctly punctate ♀, the intervals flat, smooth. Body beneath sparsely punctate, shining. Mesosternum finely carinate between the coxæ, opaque and finely alutaceous in front. Anterior tibiæ punctate in front, tridentate externally, but scarcely visibly crenate above, the first joint of anterior tarsus longer than the second. Posterior tibiæ slender, the first joint of the tarsus longer than the next three. Length .14–.18 inch; 3.5–4.5 mm.

Apart from the differences noted above no sexual differences have been observed.

With a close resemblance to the preceding species, the present has always a darker head and thorax, the sides of the latter again paler; the elytra are often clouded with darker color and when this is well marked the specimens may resemble *lividus*, which has equal spinules at the apex of the hind tibiæ. In well preserved specimens the sides of the elytra near the apex are slightly pubescent.

Occurs over our entire territory east of the Mississippi as far north as Dacota.

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Series **I-c.**

Head not tuberculate, or very feebly so. Mesosternum not carinate between the coxæ. Margin of thorax not explanate, usually with a basal marginal line. General color reddish, luteous, or yellowish testaceous, without any part being either piceous or black.

This series is more numerous in species than the preceding, and consequently less homogeneous. The following table will assist in their recognition:

Genæ at least moderately prominent ..... 2.
Genæ not prominent beyond the eye ..... 8.
2.—Large species (.30–.35 inch); punctures of thorax very coarse and irregularly scattered ..... 3.
Smaller species (.16–.22 inch); punctures of thorax not unusually coarse, quite regularly scattered ..... 4.
3.—Clypeus very obtusely rounded each side of the emargination; disc of thorax almost smooth at middle ..... **concavus.**
Clypeus subangulate each side; disc of prothorax irregularly punctate over entire surface ..... **rubidus.**
4.—Clypeus with a distinct denticle each side of emargination; basal marginal line of thorax distinct.
Hind angles of thorax broadly rounded; punctures of the elytral intervals coarser than those of the striæ ..... **militaris.**
Hind angles distinct, but obtuse; punctures of intervals not coarser than those of the striæ ..... **æmulus.**
Clypeus not denticulate ..... 5.
5.—Thorax not fimbriate at sides ..... 6.
Thorax conspicuously fimbriate; species very pale testaceous; the upper tooth of anterior tibiæ very small ..... 7.
6.—Base of thorax regularly arcuate, with distinct marginal line.
Clypeus angulate each side of emargination; hind angles of thorax rectangular, slightly obtuse at tip; punctures of elytral intervals rather close, nearly as coarse as those of the striæ. ..... **rubiginosus.**
Clypeus with barely a trace of emargination, broadly rounded each side; hind angles of thorax obtuse, but distinct; intervals sparsely finely punctate ..... **consentaneus.**
Base of thorax irregular, without trace of marginal line; intervals of elytra with extremely few punctures ..... **luteolus.**
7.—Oblique ridges of hind tibiæ very distinct.
Anterior tibiæ subtruncate, the apical tooth not much prolonged; elytra with short brownish lines ..... **phalerioides.**
Anterior tibiæ normal, the apical tooth much prolonged and very acute; elytra without lines ..... **Larreæ.**
Oblique ridges of hind tibiæ obliterated; anterior tibiæ normal, the apical tooth much prolonged and very acute; thorax with distinct, but fine basal line; elytra not maculate. ..... **parcus.**
8.—Genæ regularly narrowed from the anterior border of the eye to the front; disc of prothorax very smooth, a distinct basal marginal line; posterior tibiæ stout ..... **ægrotus.**

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A. concavus Say.—Moderately elongate, pale reddish brown, shining. Antennæ a little paler. Head convex, not tuberculate, smooth, a few fine punctures posteriorly; clypeus broadly feebly emarginate, rounded each side of emargination, sides arcuate, fimbriate, genæ moderately prominent, but obtuse. Thorax nearly twice as wide as long, the sides feebly arcuate, nearly parallel posteriorly, more arcuate in front, margin not explanate, finely fimbriate, hind angles very obtuse, base arcuate, with feeble sinuation near the hind angles, a scarcely evident marginal line; disc moderately convex, with extremely fine punctures sparsely placed with larger punctures near the base and sides more widely distant. Elytra a little narrower at base than the thorax, humeri very obtuse, sides feebly arcuate, disc deeply striate, striæ finely punctured, intervals convex, smooth. Body beneath sparsely punctate, metasternum almost entirely smooth at middle. Mesosternum not carinate, coarsely punctured with a large smooth space at middle. Anterior tibiæ smooth in front, strongly tridentate externally, not crenulate above, the first tarsal joint shorter than the second. Posterior femora with a line of coarse punctures near the knee, first joint of tarsus as long as the next three. Length .32–.34 inch; 8–8.5 mm.

In the male the anterior tibial spur is shorter and stouter, the upper middle tibial spur stouter than in the female. The thorax of the male has fewer coarse punctures at the sides and very few along the apical margin, while in the female a small central space on the disc is alone free of large punctures.

Occurs from Georgia to Missouri, Kansas and Colorado.

A. rubidus Lec.—Form moderately elongate and convex, pale reddish brown, shining. Antennæ slightly paler. Head moderately convex, obsoletely tuberculate each side, surface sparsely punctate; clypeus broadly feebly emarginate, on each side distinctly angulate the sides arcuate and fimbriate, genæ moderately prominent, but obtuse. Thorax not twice as wide as long, the sides feebly arcuate and gradually narrowed to the front, margin not explanate, scarcely fimbriate, hind angles obtusely rounded, base regularly arcuate and with fine marginal line; disc moderately convex sparsely punctured with coarse and fine punctures intermixed, the punctures coarser and closer toward the sides. Elytra as wide at base as thorax, the humeri obtuse, sides feebly arcuate, disc moderately deeply striate, striæ closely and finely punctured, intervals convex smooth. Body beneath sparsely punctate. Mesosternum not carinate, coarsely punctured smoother at middle. Anterior tibiæ smooth in front, tridentate externally, obsoletely crenulate above, the first joint of tarsus shorter than the second. Posterior femora with a row of coarse punctures near the knee, the first tarsal joint not as long as the next three. Length .24–.36 inch; 6–9 mm.

The male has merely a shorter and stouter anterior tibial spur, the thoracic sculpture does not apparently differ in the sexes.

This species resembles *concavus* in size, color and general appearance, and may be distinguished, especially, by the angulation of the clypeus on each side of the emargination. There are other less conspicuous differences observable in the description.

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Occurs in various parts of California, near San Francisco, at Alameda, in the southern coast range, Owen's Valley and in Arizona.

A. militaris Lec.—Form moderately elongate and parallel, pale reddish brown, shining. Antennæ pale. Head convex, a distinct tubercle on each side of vertex, densely and rather roughly punctured; clypeus subtruncate, feebly emarginate, with two small recurved teeth widely separated, sides arcuate and fimbriate, genæ feebly prominent, obtuse. Thorax equally wide at apex and base, sides feebly arcuate sparsely fimbriate, hind angles very broadly rounded, base regularly arcuate, with fine marginal line; disc convex, the punctures equal, moderately coarse, closely but not densely placed, denser at the sides. Elytra a little wider than the thorax, humeri obtuse, margin with short hairs, striate, striæ finely and closely punctured, intervals very slightly convex and with punctures coarser than those of the striæ, irregularly placed, with minute punctures intermixed. Body beneath sparsely and indistinctly punctate. Anterior tibiæ smooth in front, strongly tridentate externally, not crenulate above, first joint of tarsus shorter than the second. Posterior femora sparsely punctate, the first tarsal joint not as long as the next three. Length .20-.24 inch; 5-6 mm.

Male.—Anterior tibiæ sinuate on the inner side, the tibial spur entirely wanting, the apical tooth more slender and acute than usual. Upper spur of middle tibia shorter than the lower, but acute.

Female.—Anterior tibiæ normal, the spur small and acute, the apical tooth slender and long.

In this species the clypeal teeth are small and acute, and resemble the projecting tips of the labial palpi. The hind angles of the thorax are so broadly rounded that the sides and base are continuous without interruption. The intervals of the striæ had been described as densely punctulate, but the punctures are so minute as not to affect the polish of the surface. The mesosternum is not carinate, as the new and clean specimens now before me show, those previously examined in the cabinet of Dr. LeConte were not in good state.

The male sexual characters are unique, and while at least one other species has the front tibia sinuate on its inner side, this is the only one with the tibial spur absent.

Occurs in California from Siskiyou Co. (Fuchs) to San Diego (Lec.) and in Nevada.

A. æmulus n. sp.—Moderately elongate and convex, reddish brown, shining. Antennæ testaceous, club fuscous. Head moderately convex, slightly tuberculate each side, moderately densely and coarsely punctate, but not rugose; clypeus broadly, but feebly emarginate at middle; a small, slender, acute tooth each side, turned upward, a slight carina running backward from each tooth, sides of clypeus arcuate, sparsely fimbriate, genæ moderately prominent, subacute. Thorax slightly narrower in front, the sides feebly arcuate, hind angles distinct, but obtuse; base arcuate, on each side slightly oblique, a very fine submarginal line; disc moderately convex, punctuation moderately coarse, not

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densely placed, closer near the sides, less dense in the male than in the female. Elytra a little wider than the thorax, sides parallel, humeri obtuse, moderately deeply striate, striæ finely subcrenately punctured, intervals slightly convex, sparsely irregularly punctulate, the punctures more distinct in the females. Body beneath sparsely punctate; mesosternum not carinate. Anterior tibiæ smooth in front, strongly tridentate externally, distinctly crenate above, the first tarsal joint a little shorter than the second. Posterior femora sparsely punctate, the first tarsal joint not as long as the next three. Length .18–.22 inch; 4.5-5.5 mm.

Male.—Anterior tibial spur not more slender to tip, obtuse at apex. Upper spur of middle tibiæ truncate at tip, the inner angle slightly prolonged internally. Thorax less closely punctured, elytral intervals less distinctly punctured.

Female.—Anterior tibial spur slender and acute, upper spur of middle tibia acute at tip.

This species so closely resembles *militaris* that I had supposed them identical until the examination of my material for the present paper began. The males can be distinguished at first glance by the anterior tibiæ, but the hind angles of the thorax in the present species are well marked, although obtuse, and in this manner either sex may be distinguished from the preceding species.

Occurs in southern Arizona (Morrison).

A. rubiginosus Horn.—Moderately elongate, reddish brown, feebly shining. Antennæ rufo-testaceous, club slightly darker. Head convex, front with three very faint tubercles, densely punctate, punctures coarser near the sides, the intervals distinctly alutaceous; clypeus broadly emarginate, subangulate each side, sides arcuate, margin not fimbriate, genæ feebly prominent, obtuse. Thorax nearly twice as wide as long, not narrowed in front, sides feebly arcuate, margin not explanate, hind angles well defined, nearly rectangular, the tip slightly obtuse, base regularly arcuate with fine marginal line; disc convex, punctures coarse, moderately close, larger, but not denser near the side, intervals alutaceous. Elytra not wider at base than the thorax, humeri obtuse, sides feebly arcuate, striæ fine, moderately impressed, the punctures fine and rather close, intervals feebly convex, moderately densely punctured, the punctures nearly as large as those of the striæ. Body beneath sparsely punctate. Mesosternum not carinate. Anterior tibiæ smooth in front, strongly tridentate externally and crenulate above, the first tarsal joint shorter than the second. Posterior femora sparsely punctate, the first tarsal joint a little shorter than the next three. Length .22 inch; 5.5 mm.

Male.—Anterior tibial spur rather long, acute at tip and strongly arcuate; upper spur of middle tibia acute at tip.

The middle and posterior femora are slightly fimbriate along their posterior edge, and this is probably sexual, but as I do not know the female the characters of this sex cannot be given. The three species—*militaris*, *æmulus* and *rubiginosus*—very naturally group together, are very closely related and resemble each other, so that without careful examination they might be confused. The first two

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have the two small clypeal denticles, but by accident these might be lost in some specimens; in this event the form of the hind angles of the thorax and the sculpture of the intervals of the elytra will distinguish them without reference to the male characters.

One specimen, Camp Grant, Arizona.

A. consentaneus Lec.—Moderately elongate, parallel, convex, yellowish testaceous, thorax and suture slightly darker. Antennæ pale. Head convex, without trace of tubercles, sparsely punctate, the middle of front almost deprived of them, intervals finely alutaceous; clypeus hemihexagonal, very feebly emarginate, angles broadly rounded, sides feebly arcuate, genæ slightly prominent, obtuse; margin not fimbriate. Thorax slightly narrowed in front, sides feebly arcuate, hind angles broadly rounded, base regularly arcuate, a fine marginal line, disc moderately convex, sparsely punctate over the entire surface, the intervals finely alutaceous. Elytra not wider than the thorax, humeri obtuse, sides very feebly arcuate, disc rather deeply striate, striæ finely crenately punctured, intervals convex, alutaceous, sparsely finely punctulate. Body beneath sparsely punctulate. Mesosternum not carinate. Anterior tibiæ smooth in front, strongly tridentate externally and crenate above, the first tarsal joint shorter than the second. Posterior femora very sparsely punctate, the first tarsal joint not as long as the next three. Length .18-.20 inch: 4.5-5 mm.

The male has the anterior tibial spur short, stout and strongly curved, and the thorax less distinctly punctate.

A very distinct species, but without any notable peculiarities. In color it resembles some of the forms of *lividus*, but here the resemblance ceases.

Occurs from Canada to Missouri, Kansas and New Mexico, but not common.

A. luteolus n. sp.—Moderately elongate, convex, smooth, shining, body beneath, head and thorax brownish or piceo-testaceous. Abdomen and elytra dirty yellow, femora yellowish testaceous, tibiæ slightly darker. Antennæ pale. Head convex, without trace of tubercles, surface alutaceous, smooth, a very few indistinct punctures posteriorly; clypeus very feebly emarginate in front, the angles broadly rounded, sides feebly arcuate, genæ very slightly prominent subacute, margin fimbriate. Thorax nearly twice as wide as long, slightly narrower in front, sides feebly arcuate, hind angles very obtuse, base arcuate at middle, then slightly sinuate, oblique near the hind angles, without trace of marginal line; disc moderately convex, sparsely indistinctly punctate, sides sparsely punctate. Elytra not wider than the thorax, moderately elongate, humeri obtuse, sides parallel, disc rather deeply striate, striæ crenately punctured, intervals convex, very sparsely indistinctly punctulate. Body beneath almost devoid of punctures. Mesosternum not carinate. Anterior tibiæ smooth in front, tridentate externally and crenate above, the first tarsal joint shorter than the second. Posterior femora almost entirely smooth, the first tarsal joint shorter than the next three. Length .20-.22 inch; 5-5.5 mm.

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In the four specimens before me I observe no sexual differences, except that one specimen by its more slender form, more shining surface and less convex intervals, seems to be a male.

In general appearance the species resembles *consentaneus*, but is rather darker in color and differs especially in the irregular base of thorax without marginal line. It also resembles *obtusus* in form and color, and may be known by the equal spinules of the hind tibiæ of that species as well as the basal marginal line, of which no traces exist in the present species.

Collected by Prof. F. H. Snow in New Mexico.

A. phalerioides Horn.—Elongate, moderately convex, pale yellowish testaceous, elytra with short fuscous stripes. Antennæ pale, club fuscous. Head convex, without trace of tubercles, surface very sparsely finely punctate; clypeus very feebly emarginate at middle, broadly rounded each side, the sides arcuate not fimbriate, genæ very slightly prominent, obtuse. Thorax slightly arcuately narrowing from the base, hind angles well defined, but obtuse; base arcuate, oblique near the hind angles, the marginal line faintly visible at middle, disc convex, surface very finely alutaceous, the punctures very sparsely placed, irregular in size and feebly impressed. Elytra a little wider than the thorax, humeri rounded, sides feebly arcuate, disc deeply striate, striæ closely finely punctured, intervals convex, finely alutaceous and with a row of very fine distant punctures; color pale yellowish testaceous with a fuscous stripe on the sixth interval one-third from base, a second more posteriorly on the fifth, another on the third, these sometimes confluent in an oblique stripe. Body beneath very sparsely punctate and alutaceous. Anterior tibiæ smooth in front, the first tarsal joint shorter than the second. Posterior femora indistinctly, sparsely punctate, the first tarsal joint nearly as long as next three. Length .16-.20 inch; 4-5 mm.

Male.—Anterior tibiæ slightly sinuous on the inner side, the upper tooth very feeble or almost absent. Intervals of elytra scarcely convex. Posterior tibiæ slender.

Female.—Anterior tibiæ straight on the inner side, the upper tooth small, but well marked. Intervals of elytra convex. Posterior tibiæ stouter than in male.

In both sexes the anterior tibia at apex is nearly truncate, the apical tooth not prolonged anteriorly. The tibial spur is also small and inconspicuous. In facies the species resembles a small *Phaleria testacea*.

Occurs at Coney Island, N. Y., and at Atlantic City, N. J., living in regions where the sand is especially white.

A. Larreæ n. sp.—Moderately elongate, subdepressed, parallel, pale yellowish testaceous, surface with greasy lustre. Antennæ pale. Head paler, darker along the thoracic margin, front not tuberculate, feebly convex, very sparsely minutely punctate and finely alutaceous; clypeus impressed at middle and with a deep oval emargination in ♂, or moderately and more broadly emarginate ♀, the angles each side very obtuse, the margin distinctly reflexed, sides arcuate,

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slightly sinuate, genæ slightly prominent and very obtuse. Thorax very little narrower in front, the sides arcuate, the margin sparsely fimbriate, hind angles very obtuse, base regularly arcuate without marginal line; disc moderately convex, sparsely minutely punctate at middle, the punctures larger and more numerous near the sides. Elytra not wider at base than the thorax, sides very feebly arcuate, humeri obtuse, margin sparsely fimbriate; disc finely striate, striæ finely, but not closely punctate, intervals slightly convex, finely alutaceous, with fine punctures sparsely placed. Body beneath and abdomen sparsely, indistinctly punctate, finely alutaceous. Anterior tibiæ smooth in front, tridentate externally, the upper tooth small, not crenulate above, the first four tarsal joints equal in length. Posterior femora alutaceous, a few coarse punctures posteriorly, the first tarsal joint not as long as the next three, the oblique carinæ of the tibia feeble. Length .16-.18 inch; 4-4.5 mm.

Male.—Spur of anterior tibia cultriform, the inner edge of tibia somewhat sinuous. Clypeus deeply and rather narrowly emarginate.

Female.—Inner edge of anterior tibia straight, the spur slender, curved, acute. Clypeus more broadly and less deeply emarginate.

Although inconspicuous in size this species is remarkable in having a very deep emargination of the ♂ clypeus with the angles reflexed. In some specimens the marginal line of the base is slightly distinct, and in this case the very pale color and other details will enable the species to be separated from those which precede.

Taken at El Paso, Texas, on the flowers of *Larrea mexicana* by Mr. G. W. Dunn.

A. parcus n. sp.—Form rather elongate, slightly broader posteriorly, moderately convex, pale yellowish testaceous shining. Head feebly convex, front without trace of tubercles, finely alutaceous, but more shining ♂, very sparsely finely punctate ♂, very little more coarsely ♀. Clypeus subtruncate ♂, very feebly emarginate ♀, the angles rounded, sides arcuate, genæ feebly prominent, obtuse. Thorax very nearly twice as wide as long, distinctly narrower in front, sides fimbriate with moderately long hairs, arcuate, the hind angles entirely obliterated by the regular curve of the sides to the base, the latter arcuate, with very feeble sinuation each side of middle, the marginal line fine, but distinct; disc feebly convex, alutaceous, the punctuation fine and sparse, more distinct in the female, the punctures in front extremely fine. Elytra as wide at base as the thorax, humeri distinct, but obtuse; the striæ deep, obsoletely punctate, the intervals convex, with a single series of fine punctures, the surface alutaceous, but more shining in ♂. Mesosternum alutaceous, opaque. Metasternum and abdomen with very few fine punctures, surface shining. Anterior tibiæ smooth in front, tridentate externally, the upper tooth very small, but more distinct in ♀, the apical tooth unusually long and acute, first tarsal joint as long as the second. Posterior femora with a row of distant obsolete punctures near the hind border, first tarsal not quite as long as the next three. Length .12 inch; 3 mm.

No sexual differences have been observed other than those noted above.

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A small species resembling in form and color the members of Group K, but without the roughly sculptured head and the transverse clypeal plica. It is, however, very closely allied to the two preceding species.

Two specimens from eastern Florida, one of which was kindly given me by Mr. H. Ulke.

A. ægrotus Horn.—Form less elongate, robust, convex, pale castaneous, shining. Antennæ pale. Head convex, front not tuberculate, surface sparsely and extremely finely punctulate; clypeus broadly, but feebly emarginate, the angles on each side distinct, but not prominent, the sides arcuate, the genæ not more prominent than the eye. Thorax twice as wide as long, slightly narrowed in front, sides feebly arcuate, hind angles distinct, but very obtusely rounded, base arcuate and with a fine marginal line; disc convex with extremely minute, sparse punctures, and with one oval group of coarse punctures midway between the middle and sides. Elytra as wide at base as thorax, oval, sides arcuate, disc finely striate, striæ finely punctured, intervals flat, with very minute and indistinct punctures. Body beneath sparsely coarsely punctate. Anterior tibiæ smooth in front, strongly tridentate externally and crenate above, the first tarsal joint longer than the second. Posterior femora stout, sparsely punctate, the tibia stout; first tarsal joint as long as the next three. Length .12–.18 inch; 3–4.5 mm.

Male.—Anterior tibial spur not more slender to apex, the tip obtuse.

Female.—Anterior tibial spur slender and acute.

In the latter sex the fine punctures of the disc of the thorax are more distinct and (in the unique) the group of coarse punctures is absent. This may possibly be a permanent sexual character. The form of this species is more robust than usual in the genus. It is remarkable in not having the genæ more prominent than the eye.

Occurs in Florida and North Carolina.

Series I-d.

Head sometimes distinctly tuberculate or without trace of tubercles. Thorax not explanate at sides, the basal marginal line usually distinct. Anterior tibiæ smooth in front. Mesosternum without carina (except very feebly in *inquinatus*). Color in great part piceous, the head and thorax always so, although at times pale at the sides; elytra variable in color, black, piceous, dull red or yellowish and maculate.

This series is more heterogeneous than any of those which precede, as it contains those species which render inapplicable any division based on the tuberculate or non-tuberculate head.

The following table will assist in the recognition of the species:

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Clypeus denticulate or angulate each side of middle ..... 2.
Clypeus broadly emarginate at middle, very obtusely rounded each side. ..... 4.
Clypeus almost exactly semicircular ..... 7.

2.—Clypeus with a small acute tooth each side of the extremely feeble emargination; above the middle of the margin of the clypeus a finely elevated angulate line. ..... **dentiger.**

Clypeus broadly emarginate at middle, distinctly angulate each side ..... 3.

3.—Elytra entirely piceous.

Body beneath and legs piceous ..... **coloradensis.**

Body beneath and legs pale yellow; elytra often with the alternate intervals having small red spots ..... **bicolor.**

Elytra dull red, intervals strongly convex at apex, the ninth elevated in its entire length ..... **luxatus.**

Elytra yellow, maculate with black; sides of thorax somewhat paler. **serval.**

4.—Thorax with the front angles always paler, often the entire side and a portion of the head also ..... 5.

Thorax entire black as well as the head ..... 6.

5.—Basal marginal line of thorax distinct.

First joint of posterior tarsus longer than the next two.

Head entirely black; thorax very little paler at the sides; elytral spots tending to form stripes ..... **inquinatus.**

Head and thorax always paler at the sides.

The inner striæ of elytra joining the outer at apex; ground color of elytra pale yellow as in *inquinatus;* punctuation of thorax rather sparse and irregular ..... **pardalis.**

The inner three striæ entire not confluent with the outer striæ; ground color of elytra reddish yellow; punctuation of thorax moderately close ..... **leopardus.**

First joint of posterior tarsus very little longer than the second; thorax with extremely few punctures; elytra dull red; species small. **inutilis.**

Basal marginal line of thorax entirely wanting, the punctures of disc moderately coarse and evenly disposed; elytra pale reddish yellow, the sutural interval and an oblique band on each side piceous; species small, 3 mm. ..... **pumilus.**

6.—Elytra black, apex dull red, intervals flat; punctures of thorax equal, rather sparse ..... **terminalis.**

Elytra dull red, varying to nearly black, in the latter case the apex is not paler; intervals convex; punctures of thorax intermixed. **cruentatus.**

7.—Subdepressed; thorax without basal marginal line, the punctures of the disc moderately close and somewhat unequal ..... **depressus.**

Moderately convex; thorax without basal marginal line, the disc almost entirely smooth, the lateral margin conspicuously thickened. **rufipes.**

Three of the species of this group are quite common in Europe,—*rufipes, depressus* and *inquinatus.* It is not yet certain that the first two are fairly established, but the latter is here to stay.

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A. dentiger Lec.—Moderately elongate, broader posteriorly, piceous, shining. Antennæ piceous, club ferruginous. Head moderately convex, coarsely sparsely punctate, slightly rugose laterally, front not tuberculate; clypeus deflexed at middle, the margin truncate, an elevated angulated line close to the margin, on each side a small acute tooth, the sides strongly arcuate, with short fimbriæ, genæ moderately prominent, but very obtuse. Thorax twice as wide as long, slightly narrower in front, the sides feebly arcuate, hind angles broadly rounded, base regularly arcuate with submarginal line; disc moderately convex, coarsely not closely punctate, except at the angles, a distinct, smooth, median line posteriorly. Elytra as wide at base as the thorax, humeri distinct, slightly dentiform, sides arcuate, disc finely striate, punctures elongate, but not close, intervals flat, irregularly biseriately punctulate. Body beneath paler in color, sparsely indistinctly punctate. Mesosternum opaque, not carinate. Anterior tibiæ smooth in front, strongly tridentate externally and crenate above, the first tarsal joint shorter than the second. Posterior coxæ sparsely coarsely punctate, the first tarsal joint as long as the next three. Length .24-.26 inch; 6-6.5 mm.

Male.—Anterior tibial spur arcuate, the tip suddenly bent. Upper spur of middle tibia short, obtuse, emarginate at tip.

Female.—Anterior tibial spur more slender, not flexed at tip. Middle tibial spurs acute.

In the unique female the clypeal teeth are not prominent and acute, possibly by abrasion, and as this may lead to the suggestion that the species may belong to the following category, it may be observed that the elevated angulate line immediately behind the middle of the clypeal margin is quite characteristic.

Occurs in southwestern Texas, also in Arizona.

A. coloradensis Horn.—Oblong, a little broader posteriorly, piceous, shining. Antennæ rufotestaceous. Head piceous, margins brownish, moderately convex, front not tuberculate, sparsely punctate, clypeus broadly emarginate, on each side angulate, the sides arcuate, genæ moderately prominent, subacute. Thorax slightly narrowed anteriorly, sides feebly arcuate, hind angles distinct, but obtuse; base arcuate, on each side oblique near the hind angles, marginal line fine, but distinct; disc moderately convex, coarsely sparsely punctured with a few fine punctures intermixed. Elytra as wide at base as the thorax, humeri obtuse, sides feebly arcuate, disc moderately deeply striate, striæ indistinctly punctured, intervals slightly convex, sparsely punctulate. Body beneath sparsely indistinctly punctate. Mesosternum sparsely punctate, not carinate. Anterior tibiæ smooth in front, tridentate externally and distinctly crenate above, the first tarsal joint shorter than the second. Posterior femora with a line of coarse punctures posteriorly, the first tarsal joint a little longer than the next two. Length .26-.30 inch; 6.5-7.5 mm.

Male.—Spur of anterior tibia stout and strongly arcuate, upper spur of middle tibia slightly hooked at tip.

Female.—Spurs slender and acute.

The angulation of the clypeus is strongly marked in some specimens, and even reflexed, forming a tooth. This species and *dentiger*

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closely resemble each other in form and color, and may be known by the clypeus being more impressed in the latter species and with the elevated angulate line behind its margin. In well marked specimens of either the presence of the slender teeth on either side of the middle truncation of *dentiger*, or the broadly emarginate and acutely angulate clypeus of *coloradensis* will easily separate them.

Occurs in Colorado.

A. bicolor Say.—Oblong, slightly wider posteriorly, subdepressed, piceous shining, elytra often with round reddish yellow spots on the alternate intervals often more or less confluent at base, metasternum, abdomen and legs pale yellow. Antennæ testaceous, the club darker. Head rather densely, moderately coarsely punctured, front without tubercles; clypeus broadly emarginate, the angles well marked, sides feebly arcuate, the genæ very little prominent, obtuse. Thorax nearly twice as wide as long, slightly narrower in front, sides feebly arcuate, hind angles broadly rounded, base arcuate with distinct marginal line, disc convex, moderately closely punctate, the punctures somewhat unequal, denser and coarser near the sides. Elytra as wide at base as the thorax, humeri distinct, disc rather deeply striate, striæ crenately punctured, intervals convex, sparsely irregularly punctate. Body beneath sparsely indistinctly punctate. Anterior tibiæ smooth in front, tridentate externally and crenulate above, the first tarsal joint very short, the second as long as the next two together. Posterior femora sparsely finely punctate, the first tarsal joint as long as the next three. Length .18–.24 inch; 4.5–6 mm.

Male.—Anterior tibial spur inserted opposite the upper tibial tooth. Thorax less densely punctured. Middle and posterior femora fimbriate posteriorly, the posterior tibiæ sparsely fimbriate on the inner side.

Female.—Anterior tibial spur inserted opposite the middle tooth. Thorax more obviously narrowed in front and more densely punctured. Legs not fimbriate.

The vast majority of specimens of this species are entirely black above, but individuals are not rare in which the alternate intervals beginning with the third have small round reddish yellow spots, sometimes the base and scutellar region are pale.

The length of the second joint of the anterior tarsus seems rather an unusual character, and it has not been observed in any other species that the anterior tibial spur of the male is inserted so far distant from the apex.

Occurs from Can. to Tex., rarely in Massachusetts (Blanchard).

A. luxatus n. sp.—Oblong, slightly broader posteriorly, piceous nearly black, elytra dull red, legs brownish, surface feebly shining. Antennæ testaceous, club darker. Head moderately convex, without frontal tubercles, surface finely alutaceous, rather closely coarsely punctured posteriorly, more coarsely punctate at sides, at middle more finely punctate; clypeus broadly emarginate,

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the angles sharply prominent, sides arcuate, sparsely fimbriate, genæ very little prominent, obtuse. Thorax twice as wide as long, very little narrowed in front, sides feebly arcuate and slightly undulated, the margin in front very narrowly explanate, hind angles distinct, but obtuse; base regularly arcuate with distinct marginal line; disc convex, coarsely, closely and very regularly punctate over the entire surface. Elytra a little narrower at base than the thorax, humeri distinctly dentiform, sides feebly arcuate, disc moderately deeply striate, the striæ rather broad and catenulately punctured, intervals feebly convex at base, costiform at apex, the ninth interval costiform from the humeral umbone to apex, the intervals very distinctly alutaceous, irregularly biseriately punctulate. Body beneath sparsely indistinctly punctulate. Mesosternum coarsely punctate, not carinate. Anterior tibiæ smooth in front, tridentate externally, obsoletely crenulate above, the first tarsal joint shorter than the second. Posterior femora sparsely punctate, the first tarsal joint as long as the next three. Length .14 inch; 3.5 mm.

Male.—Anterior tibial spur stout, truncate at tip. Upper spur of middle tibia somewhat cultriform, broad with the tip prolonged inward.

Female.—Tibial spurs slender and acute.

The elytral characters alone are sufficient to enable the species to be readily recognized. It is the only one known to me in our fauna with the intervals so decidedly elevated at apex and with the ninth elevated in its entire extent. The dull red elytra, the angulate clypeus and the closely punctured thorax are additional characters of easy recognition.

Occurs in the southern part of California (Ulke) and in Arizona.

A. serval Say.—Form moderately elongate, parallel, piceous, elytra yellow maculate, legs reddish brown. Antennæ rufo-testaceous, club darker. Head piceous, the margins paler, translucent, front faintly trituberculate, surface coarsely punctured, the middle of front smoother; clypeus emarginate at middle, the angles distinct, sides oblique, slightly sinuate, genæ moderately prominent, obtuse. Thorax nearly twice as wide as long, sides nearly parallel, arcuate near the front angles, the hind angles distinct, slightly obtuse, base arcuate, marginal line distinct, disc convex, piceous, the sides brownish, surface with an intermixed punctuation, coarser near the base and sides, moderately closely placed. Elytra a little narrower at base than the thorax, humeri distinct, sparsely dentiform, disc finely striate, the striæ not closely punctured, intervals flat, very sparsely indistinctly punctulate, color yellowish, the side margin and apex slightly reddish, maculate with black spots arranged in a semi-circle from the base of the fifth interval, another arcuate row of spots on the declivity, a few near the apex and a rather broad lateral stripe. Body beneath indistinctly punctate. Mesosternum coarsely punctate, not carinate, opaque at middle. Anterior tibiæ smooth in front, tridentate externally and crenate above, the first tarsal joint shorter than the second. Posterior femora sparsely punctulate, the first tarsal joint nearly as long as the next three. Length .18 inch; 4.5 mm.

Male.—Anterior tibial spur long, scarcely more slender to tip; apex obtuse.

Female.—Spur slender, acute, shorter.

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The male anterior tibial spur is prolonged much beyond the apical tooth reaching nearly the tip of the third tarsal joint, in the female it barely reaches the tip of the second joint.

From the style of marking and color of elytra this species should be associated with *pardalis* and *inquinatus* and was so placed at the time when the frontal tubercles could be used as a means of separating groups, but this character has ceased to be of any importance and its use has already been the means of some misunderstanding.

Occurs from the Middle States to Texas.

A. inquinatus Herbst.—Oblong, convex, black, shining, elytra yellowish with black spots and vittæ, thorax with anterior angle often the entire side pale, femora yellowish, tibiæ darker. Antennæ piceous, club nearly black. Head entirely black, front trituberculate, disc sparsely punctate, the sides more densely and somewhat rugulose; clypeus very feebly emarginate, the angles broadly rounded, the sides arcuate, genæ feebly prominent, obtuse. Thorax convex, slightly narrower in front, sides arcuate, hind angles distinct, but obtuse, base arcuate with fine marginal line, disc convex variably punctate in the sexes. Elytra parallel, humeri distinct, but obtuse; disc striate, striæ finely crenately punctured, intervals feebly ♂ or more ♀ convex, with extremely fine punctures near the striæ; color yellow, with two sub-basal spaces of irregular shape on each elytron, another posteriorly, one-third from apex, a lateral stripe piceous, these often more or less confluent. Body beneath sparsely punctate, the abdomen alutaceous. Mesosternum alutaceous, opaque, an extremely fine carina between the middle coxæ. Anterior tibiæ smooth in front, strongly tridentate externally and crenate above, the first tarsal joint distinctly shorter than the second. Posterior femora sparsely punctate, alutaceous, the first joint of hind tarsus not as long as the next three. Length .18–.22 inch; 4.5–5.5 mm.

Male.—Head rather sparsely punctate. Middle tubercle of front more prominent. Thorax wider than the elytra and very convex, scarcely perceptibly punctate at middle a few punctures near the side. Metasternum feebly concave, finely sparsely hairy. Spur of anterior tibia stout, feebly curved, acute at tip.

Female.—Head more densely punctate. Middle tubercle not prominent. Thorax not wider than the elytra and less convex, the surface sparsely, but distinctly punctate everywhere. Metasternum flat. Anterior tibial spur more slender.

This species is so well known that it is hardly necessary to enter into any detailed description of the style of markings, the spots are, however, variable in size, and often more or less confluent, while they preserve the general type above described. Many details of variation have been described by Erichson (Ins. Deutsch. iii, p. 841), to which those specially interested are referred.

This species has been introduced from Europe, and is widely diffused over our territory east of the Rocky Mountains. I have not yet seen it from the Pacific region.

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A. pardalis Lec.—Moderately elongate and convex, parallel, piceous, shining; head in great part, sides of thorax, legs and elytra yellow, the latter maculate with black spots. Antennæ testaceous, club fuscous. Head convex, very plainly trituberculate ♂, or feebly so ♀, surface coarsely and densely punctured ♀ or more coarsely and less densely ♂; front hemi-hexagonal, the clypeus very feebly emarginate with rounded angles, the genæ feebly prominent and obtuse. Thorax nearly twice as wide as long and not narrower in front ♂, or less wide and slightly narrowed in front ♀, the sides strongly arcuate ♂, or feebly arcuate ♀, the hind angles distinct, but obtuse; the base broadly arcuate, basal marginal line distinct, disc convex, sparsely finely punctured, the punctures a little coarser toward the side, more evident in the ♀; color piceous, the sides rather broadly yellow. Elytra narrower than thorax ♂ or wider ♀, moderately deeply striate, striæ crenately punctured, intervals slightly convex and sparsely punctulate, the punctures very distinct ♀, or scarcely so ♂: color pale yellow with piceous spots arranged in a design as follows: a small spot at base of fifth interval, others on the intervals 3–4–5 forming a semi-circle, the intervals 7–8 with a broad stripe extending from the humeral umbone three-fourths to apex, and with other spots between the end of this stripe and the suture. Body beneath sparsely, indistinctly punctate. Mesosternum opaque and alutaceous at sides with an oval smoother space at middle, not carinate between the coxæ. Anterior tibiæ smooth in front, tridentate externally, obsoletely crenate above, the first tarsal joint shorter than the second. Posterior femora alutaceous, sparsely punctate, the first tarsal joint nearly as long as the next three. Length .22 inch; 5.5 mm.

Male.—Head almost entirely yellow, merely the occiput and a median oval space piceous, the front distinctly tuberculate, the median tubercle quite prominent. Spur of anterior tibia rather stout, feebly curved. Upper spur of middle tibia truncate, its inner angle prolonged inward.

Female.—Head piceous, the lateral and apical margins paler, front barely perceptibly tuberculate. Spur of anterior tibia more slender, the upper spur of middle tibia acute.

The elytral markings in this species are far less variable than in *inquinatus*, and form a very different design. This is one of the species which makes it unadvisable to use the frontal tubercles as a means of separating groups as the female is almost entirely devoid of them.

Occurs on the Pacific coast from San Francisco to Vancouver. I have seen one in the cabinet of the late Mr. Wilt marked Filmore, Nebraska.

A. leopardus Horn.—Oblong, slightly broader posteriorly, dark brownish, entire margin of head and sides of thorax paler, elytra dark reddish yellow, indistinctly maculate, legs rufo-testaceous. Antennæ pale. Head moderately convex, front indistinctly tuberculate, surface coarsely sparsely punctured. Clypeus hemihexagonal, feebly emarginate in front, the angles rounded, genæ moderately prominent, but obtuse. Thorax nearly twice as wide as long, slightly narrowed in front, the sides feebly arcuate, hind angles distinct, but obtuse; base arcuate with fine marginal line, disc convex, coarsely rather sparsely punctate over the entire surface with finer punctures intermixed. Elytra as wide at base

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as the thorax, humeri obtuse; disc moderately deeply striate, striæ crenately punctured, intervals slightly convex, very minutely sparsely punctate. Body beneath sparsely, abdomen more closely punctate. Mesosternum alutaceous and sparsely punctate. Anterior tibiæ smooth in front, tridentate externally and crenate above, the first tarsal joint shorter than the second. Posterior femora very sparsely punctate and finely alutaceous, the first tarsal joint nearly as long as the next three. Length .26-.28 inch; 6.5-7 mm.

Male.—Spur of anterior tibia stout, strongly arcuate.

Female.—Spur slender and feebly arcuate.

This species is larger than either of the preceding with maculate elytra, and is not as dark in color on the thorax or beneath. The inner three striæ reach the tip of the elytra and are not united with the outer striæ.

The maculation of the elytra is never distinct, but it presents the same style as has been described for *pardalis*. The same style of arrangement of darker spaces may be observed in *aleutus*, in which, however, they are more diffused.

Occurs in Maine and eastern Canada.

A. inutilis n. sp.—Oblong, moderately robust, piceous, sides of thorax paler, elytra dull red, legs yellowish. Antennæ pale, the club darker. Head moderately convex, sparsely punctate, front not tuberculate, but with the frontal suture slightly elevated; clypeus hemihexagonal, very feebly emarginate in front with rounded angles, the genæ scarcely prominent, very obtuse. Thorax convex, slightly narrowed in front the sides feebly arcuate, hind angles very obtuse, base arcuate, with fine marginal line, disc sparsely finely punctate with coarser punctures intermixed along the base and at the sides. Elytra a little wider at base than the thorax, humeri distinct, sides parallel, striæ moderately deep and rather coarsely crenately punctate, the intervals slightly convex with a single series of very fine punctures. Body beneath very indistinctly punctate, abdomen rather coarsely punctate at the sides. Mesosternum opaque and strigose at middle, coarsely punctate at sides, not carinate between the coxæ. Anterior tibiæ smooth in front, strongly tridentate externally, but not crenate above, the first tarsal joint shorter than the second. Posterior femora with extremely few punctures, the first four tarsal joints decreasing gradually in length, the first being shorter than the next two together. Length .14 inch; 3.5 mm.

The two specimens before me have the anterior tibial spur slender and acute, they are probably females.

This species is small and inconspicuous in its characters, those given in the table are the more conspicuous. The comparative shortness of the first joint of the hind tarsus will readily distinguish the species from any other in the group.

Occurs at San Francisco, Cal., and in Oregon.

A. pumilus n. sp.—Oblong, convex, parallel, piceous or nearly black, side of thorax indefinitely paler, elytra yellowish, the sutural interval, oblique stripe, lateral space and subapical spot piceous, legs yellowish testaceous. Antennæ tes-

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taceous with darker club. Head convex, without trace of frontal tubercles, coarsely punctate, less densely at middle of clypeus and very closely at the sides; clypeus very broadly and feebly emarginate, the angles broadly rounded, the sides feebly arcuate, genæ feebly prominent, obtuse. Thorax twice as wide as long, narrower in front, the sides very feebly arcuate, the hind angles distinct, but obtuse; base arcuate, without marginal line, disc convex, the punctures relatively coarse and equal and very evenly disposed over the entire surface, scarcely closer at the sides. Elytra as wide at base as thorax, humeri distinct, sides parallel, the striæ not deep, but moderately coarse and close, the intervals flat, very distinctly biseriately punctate. Metasternum at sides with a few coarse punctures, abdomen indistinctly punctate, Mesosternum opaque and alutaceous, an oval smoother space at middle, not carinate between the coxæ. Anterior tibiæ smooth in front, tridentate externally and denticulate above, the first tarsal joint shorter than the second. Posterior femora sparsely punctate, the first tarsal joint as long as the next three. Length .12 inch; 3 mm.

The unique before me is probably a male, it has the interior tibial spur rather stout and slightly arcuate. The elytra are very distinctly marked. The sutural interval is piceous. The oblique stripe of the disc is rather broad, begins behind the humeral umbone, extends two-thirds to apex, ends obtusely, its inner edge reaching the second stria. The subapical spot is posterior to the end of the oblique band. At the side the piceous space is adjacent to the margin and is not of great extent.

This is the smallest genuine Aphodius in our fauna, and remarkable in its very distinct and relatively coarse sculpture for so small a species. The absence of a basal marginal line in a species in this part of the series is remarkable.

One specimen from New Mexico.

A. terminalis Say.—Oblong oval, moderately convex, black, shining, apex of elytra reddish brown. Antennæ and palpi piceous. Head convex, without trace of tubercles, coarsely punctate, slightly rugose at sides and in front. Clypeus hemihexagonal, feebly emarginate in front, the angles obtuse, sides very feebly arcuate, genæ feebly prominent, rounded. Thorax convex, slightly narrower in front, sides nearly straight posteriorly and slightly convergent anteriorly, in front feebly arcuate, hind angles nearly rectangular, somewhat obtuse, base arcuate and with distinct marginal line, disc convex, very sparsely finely punctured at middle, punctures coarser and closer toward the sides, especially near the front angles. Elytra as wide at base as at the thorax, humeri distinct, but obtuse; striæ fine, but moderately deep; punctures close, not coarse; intervals very flat, indistintly biseriately punctulate. Mesosternum very opaque, not carinate between the coxæ. Metasternum opaque, subgranulate. Abdomen more shining, alutaceous, sparsely indistinctly punctate. Anterior tibiæ smooth in front, tridentate externally, crenate above, the first tarsal joint shorter than the second. Posterior femora coarsely sparsely punctate, the first tarsal joint shorter than the next three. Length .16-.20 inch; 4-5 mm.

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Male.—Anterior tibial spur long, arcuate, not more slender to tip, extending beyond the apical tooth and the second tarsal joint.

Female.—Anterior tibial spur more slender to tip, less arcuate, and shorter than in the male. Thorax more distinctly punctured at middle.

This species although shining seems to connect the present series with the *lutulentus* group by its general form and the very flat elytral intervals. The angles of the clypeus are less broadly rounded than in the adjacent species, although not angulate as in *bicolor*, etc. The reddish brown space at the apices of the elytra is always present, although it varies not only in size, but also in distinctness.

Occurs from the Middle States to Kansas and Texas.

A. cruentatus Lec.—Oblong oval, moderately convex, piceous or black; elytra dull red, nearly as in *fimetarius*, varying to piceous, legs dark brown to black. Antennæ brownish, club piceous. Head moderately convex, front indistinctly trituberculate, surface moderately coarsely not closely punctured. Clypeus hemihexagonal, broadly feebly emarginate in front, the angles very obtuse, sides feebly arcuate, genæ moderately prominent, but obtuse. Thorax twice as wide as long, less obviously so in the female, slightly narrower in front, the sides feebly arcuate from base to apex, hind angles distinct, but rounded; base regularly arcuate, the marginal line fine, but entire; disc moderately convex, the punctuation not dense, intermixed, a little closer at the sides. Elytra a little wider than the thorax, humeri distinct, but obtuse; striæ moderately deep, relatively finely punctate, intervals slightly convex, indistinctly biseriately punctulate. Mesosternum opaque and alutaceous, smoother at middle. Metasternum opaque and alutaceous, smoother at middle. Metasternum sparsely punctate at the sides. Abdomen indistinctly punctate. Anterior tibiæ smooth in front, tridentate externally, indistinctly crenate above, first tarsal joint shorter than the second. Posterior femora very sparsely punctate, the first tarsal joint nearly as long as the next three. Length .22-.30 inch; 5.5-7.5 mm.

Male.—Frontal tubercles rather more distinct. Thorax broader, more convex, at middle less punctate. Anterior tibial spur stout and moderately curved.

Female.—Frontal tubercles feeble. Thorax narrower, less convex and more punctate. Anterior tibial spur slender, less arcuate.

This species was described by Dr. LeConte from a single specimen, and some of the characters given by him are purely individual. The series before me consists of twenty specimens selected from a large number collected by Mr. A. S. Fuller, in New Mexico, and by Morrison in Arizona. Two varieties may be indicated—those with dull red elytra and those entirely black, with, however, all the intermediates in color without any differences of form or sculpture. I am informed by Mr. H. W. Bates that the black forms from Arizona have been distributed by Morrison as *ursinus*, which they resemble in a general way, but differ especially in the unequal spinules of the tibiæ. The forms with red elytra resemble *rubripennis*, which, however, differs in many ways.

Occurs in Arizona and New Mexico.

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A. rufipes Linn. Oblong, moderately elongate, parallel, piceous to reddish brown, shining. Antennæ and palpi reddish brown. Head feebly convex or slightly elevated at middle of front ♀, surface very smooth with excessively fine punctures, others slightly more distinct toward the sides. Clypeus almost semi-circular, without trace of emargination, the genæ prominent, subacute. Thorax twice as wide as long, slightly narrowed in front, sides with short fimbriæ, feebly arcuate, the extreme lateral margin thickened, hind angles obtusely rounded, base regularly arcuate without trace of marginal line, disc moderately convex, almost entirely smooth, with a few punctures along the sides, especially near the anterior and posterior angles. Elytra as wide at base as the thorax, humeri obtuse, sides parallel, striæ moderately deep, finely punctured, intervals slightly convex, sparsely very finely punctulate. Mesosternum coarsely punctate, an opaque space on each side. Metasternum at sides and abdomen sparsely punctate. Anterior tibiæ smooth in front, tridentate externally, serrate above, the first tarsal joint longer than second. Posterior femora sparsely punctulate, with an impressed line posteriorly formed of closely placed punctures, the first tarsal joint a little longer than the next three. Length .42–.50 inch; 11–13 mm.

Male.—Head evenly convex. Thorax a little broader than the elytra and less convex. Metasternum slightly longitudinally impressed.

Female.—Head with a slightly greater convexity at middle. Thorax not wider than the elytra.

This species will be readily known by its large size, semicircular head, thickened thoracic border, and the comparatively smooth surface of the entire body.

Three specimens are known to have been taken in our country, two by Mr. H. Ulke at Deer Park, Maryland, attracted by light at night, and another has been seen by Dr. Hamilton captured in southern Pennsylvania. The occurrence of a comparatively common European species in such an inland and comparatively wild region without having even been found about commercial centres leads to the belief that it may be indigenous to the region and not introduced. A parallel case may be cited in *Nomius pygmæus*, which occurs very rarely in southern Europe, and at times abundantly in the Lake Superior region.

A. depressus Kug.—Oblong oval, moderately convex, black, moderately shining (elytra sometimes red). Antennæ piceous, the club black, palpi piceous. Head moderately convex, moderately finely not closely punctate, front without trace of tubercles. Clypeus semicircular, without trace of emargination the genæ prominent and arising rectangularly in front of the eye. Thorax not quite twice as wide as long, distinctly narrowed in front, the sides nearly straight posteriorly, arcuate in front, hind angles rounded, base arcuate without trace of marginal line; disc moderately convex, the punctures moderate in size and nearly equal, closely, but not densely placed. Elytra as wide at base as the thorax, humeri obtuse, disc striate, the striæ rather closely punctate, intervals feebly convex, confusedly, but not closely punctate. Mesosternum alutaceous, but feebly shining. Metasternum at middle shining, coarsely sparsely punctate, at sides opaque, less

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distinctly punctate. Abdomen feebly shining, sparsely punctate. Anterior tibiæ smooth in front, tridentate externally and crenate above, the first tarsal joint longer than the second. Posterior femora with an entire row of very coarse punctures near the posterior border and others nearly as coarse anteriorly, the first tarsal joint a little longer than the next three. Length .34 inch; 8.5 mm.

The specimen before me is a female, and has the spur of the anterior tibia acute.

The specimen referred to *depressus* varies from the descriptions in having the elytra slightly opaque near the apex, but without any trace of pubescence as in *luridus*. The first three elytral striæ are entire, the fourth curves to join the sixth, the latter prolonged, gradually becoming effaced near the apex. The unique before me belongs to the variety described by Erichson as *atramentarius*, and from the careful discussion of the relation of this with the true *depressus* by Baron Harold (Ann. Fr. 1862, p. 301) the reference of my specimen to this species is made. In a male specimen, from Europe, just sent me by Dr. Hamilton, I observe that the slight variation alluded to is purely sexual, the male being more shining, while the thorax is less closely punctate.

One specimen, New York, given me by Mr. Aug. Merkel. I have not heard of any other specimens, and it is barely possible that this may be an accidental introduction.

Group K.

Scutellum small. Head convex, not trituberculate, but very roughly punctured, clypeus with a more or less distinct transverse carina. Anterior tibiæ tridentate, very indistinctly serrulate above, the tarsus with first joint a little shorter than the second. Posterior tibiæ fimbriate with unequal spinules, the first tarsal joint not as long as the next three. Mesosternum not carinate.

The species forming this group associate themselves naturally not only by their characters, but also by their appearance. They are as follows:

Clypeus emarginate at middle, without teeth.
  Head bicolored, sides of thorax conspicuously paler, the elytra much paler than thorax.....**scabriceps.**
  Head brown, thorax conspicuously coarsely punctured, the sides scarcely paler. **nanus.**
Clypeus emarginate and acutely dentate each side. Uniform ferruginous brown. **acerbus.**

In these three species it will be observed that the terminal joint of the maxillary palpi is much stouter, *i.e.* more fusiform than is usual in the genus.

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A. scabriceps Lec.—Moderately elongate, somewhat broader behind, convex, brownish, elytra yellow with the suture narrowly darker. Antennæ pale rufo-testaceous. Head convex, dark brown behind the frontal suture, testaceous brown anteriorly, front not distinctly tuberculate, very coarsely, deeply and rather closely punctate, almost cribrate. Clypeus hemihexagonal, a feebly elevated transverse carina, anterior margin rather deeply emarginate, the angles on each side rounded, sides arcuate and slightly sinuate, genæ very feebly prominent and obtuse. Thorax scarcely narrowed in front, the sides slightly arcuate and sparsely fimbriate, hind angles distinct, but obtuse; base arcuate, with distinct marginal line, surface with moderate punctures, regularly, but not closely placed, less dense toward the sides; color brown, the sides indefinitely paler. Elytra a little wider than the thorax, humeri obtuse, slightly wider behind the middle, disc striate, the punctures moderately close and coarse, the intervals convex, each with a row of distant finer punctures. Body beneath coarsely, but sparsely punctate, the abdomen alutaceous or sparsely pubescent. Legs rufo-testaceous, posterior femora smooth, with a short row of coarse punctures near the knee, first joint of hind tarsus a little longer than the next two. Mesosternum not carinate, smooth at middle, alutaceous each side. Length .12–.14 inch; 3.–3.5 mm.

In the four specimens before me I have not observed any sexual differences.

A very pretty little species by its pale yellow elytra and the bicolored head. It resembles *rugiceps* in the rough sculpture of the head, but the spinules of the tibiæ are unequal and closely placed, but are less unequal in length than is usual in the series.

Occurs in Colorado.

A. nanus n. sp.—Oblong, parallel, brownish, elytra paler, brownish testaceous. Antennæ pale rufo-testaceous. Head convex, coarsely punctured and wrinkled, front without distinct tubercles. Clypeus hemihexagonal, impressed in front and deeply emarginate, the angles rounded, the sides arcuate, a distinct transverse carina, genæ slightly prominent above. Thorax convex, the sides nearly parallel, slightly arcuate, sparsely fimbriate, hind angles well defined, but obtuse, base arcuate, with distinct marginal line, disc rather coarsely, but sparsely punctured, the punctures gradually finer and sparser near the side, the sides of thorax usually paler. Elytra as wide at base as the thorax, humeri obtuse, sides parallel, disc rather deeply striate, the punctures moderately coarse and close, the intervals convex with a row of distant irregular punctures. Body beneath very sparsely punctate, abdomen very sparsely pubescent. Posterior femora smooth, first joint of hind tarsus a little larger than the next two. Mesosternum not carinate, opaque in front with a narrow median smooth space. Length .10–.14 inch; 2.5–3.5 mm.

No sexual differences have been observed in the seven specimens examined.

This species is closely related to *scabriceps*, but the head is uniformly colored, the thorax more coarsely punctured, the spinules of the hind tibiæ much longer and less close, and the clypeus more deeply emarginate.

Occurs at Carrizo Springs, Texas (Schaupp).

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A. acerbus n. sp.—Oblong, moderately convex, parallel, reddish brown, moderately shining. Antennæ rufo-testaceous. Head convex, coarsely and deeply, not densely punctured, front not tuberculate. Clypeus with a distinct transverse carina, impressed in front, moderately deeply emarginate at middle, on each side a small acute tooth, sides irregularly arcuate, genæ feebly prominent and obtuse. Thorax distinctly narrowed in front, the sides feebly arcuate, sparsely fimbriate, hind angles very obtusely rounded, base arcuate, with distinct submarginal line, disc convex, relatively coarsely, but sparsely punctured, the punctures finer and obsolete near the sides. Elytra as wide as the thorax, humeri obtuse, sides parallel, disc striate, striæ moderately coarsely and closely punctured, intervals convex, with a single series of irregular finer punctures. Body beneath sparsely indistinctly punctate, abdomen with slight pubescence. Posterior femora smooth, the first joint of hind tarsus very little longer than the next two. Length .12 inch; 3 mm.

No sexual characters observed in two specimens.

This is a small and inconspicuous species resembling *nanus* in form and coloration, but differing in the very distinctly bidentate clypeus.

Occurs in Texas, probably near San Antonio.

Group L.

Scutellum small. Front not distinctly tuberculate. Elytra more or less pubescent. Mesosternum not carinate between the coxæ. Thorax with basal marginal line, except in *rubripennis*.

This group, although containing but few species, is somewhat heterogeneous, the first and last species being the troublesome elements, while the others naturally associate themselves.

The following table will enable them to be separated:

Genæ at least moderately prominent; head and thorax in great part black.
- Thorax entirely black, without basal marginal line; clypeus almost semicircular; elytra reddish.....**rubripennis.**
- Thorax pale at the sides, a distinct basal line.
  - Elytra entirely yellow, merely the suture darker.....**subtruncatus.**
  - Elytra clouded with fuscous.
    - Sides of thorax fimbriate with rather long hair; anterior tibiæ with upper tooth small or wanting.....**Walshii.**
    - Sides of thorax not fimbriate; anterior tibia normal.
      - Elytra with greasy aspect, the pubescence well marked, color almost entirely fuscous.....**femoralis.**
      - Elytra shining, pubescence feeble and deciduous, color more of yellow than of fuscous.....**prodromus.**

Genæ not at all prominent; entire surface ferruginous; pubescence well marked; species rather small.....**tenuistriatus.**

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A. rubripennis Horn.—Oblong oval, feebly convex, piceous black, moderately shining, elytra dull red or reddish yellow, legs brown, tarsi much paler. Antennæ ferruginous, the club somewhat darker, palpi pale. Head moderately convex, without trace of frontal tubercles, surface shining with very fine sparse punctures, a few coarser punctures near the sides. Clypeus nearly semicircular, slightly obtuse in front, but without trace of emargination, genæ moderately prominent, but obtuse. Thorax nearly twice as wide as long, slightly narrowed in front, sides feebly arcuate, more distinctly so anteriorly, the hind angles broadly rounded, base feebly arcuate, without trace of marginal line, disc moderately convex, sparsely very finely punctate, a few coarse punctures along the base, others more numerous near the side. Elytra as wide as thorax, the humeri distinct, not obtuse; sides feebly arcuate, disc rather finely striate, striæ with fine punctures, the intervals feebly convex, biseriately punctulate, on some of the intervals irregularly punctulate; color of elytra dull red or reddish yellow, the apical third and sides narrowly slightly darker as if stained, the pubescence yellowish, extremely fine and short, more distinct on the apical darker region. Mesosternum opaque, sparsely punctate. Metasternum sparsely punctate at middle, more densely, also opaque at the sides. Abdomen distinctly, not closely punctate. Anterior tibiæ smooth in front, tridentate externally and crenate above, the first tarsal joint as long as the second. Posterior femora sparsely punctate, a series of coarse punctures near the knee, the first tarsal joint as long as the next four together. Length .28–.30 inch; 7–7.5 mm.

The only differences that seem to be sexual are found in the less shining elytra of the female with the thorax somewhat narrower and the sides less arcuate.

This species is easily known by the nearly semicircular clypeus, the reddish elytra finely pubescent near the apex, the pale red tarsi, the first joint of the hind tarsi being of an unusual length. It represents in our fauna *luridus*, of Europe, and by the adoption of the groups proposed by Erichson, would be included with that species and *depressus* in Group I.

Should the pubescence be entirely removed by accident from any specimens they would doubtless be referred to Group I and the table would lead directly to *depressus* and indicate its relationship.

Occurs in Canada and Pennsylvania; taken rather abundantly by Mr. Ulke in Maryland.

A. subtruncatus Lec.—Moderately elongate, parallel, body beneath dark brown, head and thorax piceous black, sides of thorax, elytra (the suture narrowly darker) and legs yellow. Antennæ testaceous, club fuliginous. Head moderately convex without trace of tubercles, sparsely punctate ♂, or coarsely densely punctate at sides and front ♀; clypeus truncate with very feeble trace of a broad emargination, the angles broadly rounded, sides feebly arcuate, genæ slightly prominent and obtuse. Thorax moderately convex, slightly narrowed in front, the sides feebly arcuate, hind angles very obtusely rounded, base arcuate with very fine marginal line; disc with moderate punctures nearly equal in size,

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not closely placed, not more dense near the sides. Elytra as wide as the thorax, humeri obtuse, sides feebly arcuate posteriorly, disc moderately deeply striate, striæ crenately punctured, intervals moderately convex, indistinctly sparsely punctate. Mesosternum opaque and alutaceous, rugose at the sides, not carinate. Metasternum at sides opaque, indistinctly punctate. Abdomen alutaceous, coarsely indistinctly punctate. Anterior tibiæ smooth in front, tridentate externally and distinctly crenate above, the first tarsal joint shorter than the second. Posterior femora sparsely punctate, a row of coarse punctures distantly placed extending the entire length of femur, the first tarsal joint nearly as long as the next three. Length .20 inch; 5 mm.

Male.—Head sparsely punctate, the punctures a little closer, not coarser, near the sides and front. Anterior tibial spur stout, curved near the tip.

Female.—Head more coarsely punctate, much more densely and coarsely at sides and front. Anterior tibial spur slender and acute.

The elytra in this species are of the same pale yellow color as seen in the paler parts of *prodromus*. The scutellum and sutural interval are piceous, the interval being extremely narrow as it approaches the apex. The pubescence of the elytra is very fine and easily abraded, but the facies of the species is so nearly that of *femoralis* or *prodromus*, that there will be no difficulty in recognizing its relationship.

Occurs in Colorado and Nebraska.

A. Walshii Horn.—Moderately elongate, slightly broader posteriorly, body beneath brown, head and thorax piceous-black, the latter with broadly yellow sides, elytra fuscous less shining, the base and sides dull yellow, legs yellow. Antennæ testaceous, club darker, palpi pale. Head moderately convex, without trace of tubercles, very sparsely and finely punctate in both sexes. Clypeus broadly feebly emarginate in front, the angles broadly rounded, slightly reflexed, sides oblique, genæ scarcely at all prominent. Thorax less than twice as wide as long, slightly narrowed in front, sides moderately arcuate, the margin fimbriate, hind angles rounded, base arcuate with very fine marginal line; disc moderately convex, very finely and sparsely punctate, a few coarse punctures near the sides. Elytra as wide at base as the thorax, humeri obtuse, sides feebly arcuate, moderately deeply striate, striæ very finely punctured, intervals convex, alutaceous with few extremely fine punctures, the three outer intervals more distinctly punctate; elytral margin fimbriate with moderately long hairs. Mesosternum finely alutaceous, a smoother space at middle. Metasternum alutaceous with very few scattered punctures. Abdomen sparsely punctate, alutaceous, sparsely hairy. Anterior tibiæ smooth in front, externally bidentate, the upper tooth wanting in ♂, or very feeble ♀, not crenate above, the first joint of the tarsi as long as the second, joints 2-3-4 scarcely longer than wide. Posterior femora alutaceous, with very few punctures, the first tarsal joint as long as the next three. Length .20-.24 inch; 5-6 mm.

Male.—Anterior tibia sinuate on the inner side and fimbriate, a distinct emargination opposite the second tooth, spur moderately stout, suddenly flexed at tip. Metasternum deeply sulcate. Posterior femora with a dentiform process from the middle of the posterior margin, sometimes very feeble.

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Female.—Anterior tibiæ of normal form, the upper tooth more distinct than in the male, the spur slender and acute. Metasternum feebly sulcate. Posterior femora without tooth.

The female front tarsi are also a little longer than in the male, joints 2–3–4 being each longer than wide.

At first sight this species might readily be mistaken for *femoralis* by its form and coloration, but may be known by the feeble punctures of the striæ. The pubescence is very evanescent and the majority of cabinet specimens rarely show any.

Occurs in Illinois and Kansas.

A. femoralis Say.—Oblong, nearly parallel, moderately convex, piceous black, sides of thorax indistinctly yellow, elytra fuscous, the base and often the entire margin paler, femora reddish yellow, tibiæ darker. Antennæ testaceous, club piceous. Head feebly convex, front very feebly trituberculate, surface shining, very sparsely finely punctate ♂, or coarsely and rather closely punctate ♀: clypeus subtruncate, angles broadly rounded, sides arcuate, genæ moderately prominent, subacute. Thorax nearly twice as wide as long ♂, somewhat narrower in the ♀, slightly narrowed in front, sides arcuate ♂, nearly straight posteriorly ♀, hind angles distinct, but very obtuse, base arcuate, the marginal line fine, but entire; disc more convex in the ♂, sparsely and very finely punctate in ♂, more coarsely and closely ♀. Elytra as wide at base as the thorax, humeri obtuse, sides slightly arcuate, the disc with the striæ fine and punctured, the intervals convex, rather closely punctate at their sides, the punctures confused with those of the striæ so that the striæ seem rather to be grooves confusedly punctured, the outer intervals less punctate. Mesosternum rather coarsely punctate, not carinate. Metasternum and abdomen obsoletely punctate. Anterior tibiæ tridentate externally, subcrenate above, the first tarsal joint shorter than the second. Posterior femora very sparsely punctate, the first tarsal joint as long as the next three. Length .18–.26 inch; 4.5–6.5 mm.

Male.—Anterior tibial spur rather stout, not more slender to tip and obtuse. Elytra more coarsely punctured, the intervals apparently narrower.

Female.—Anterior tibial spur gradually more slender and acute at tip. Elytra less punctate, the intervals broader.

In addition to the above characters, those of the head and thorax are much more evident. The male elytra are also more shining, the female finely alutaceous and with a greasy aspect. In both sexes each interval has at summit a row of very distant punctures. The color of the elytra is a little variable, and it will be observed that the males are paler than the females, the general color of the form being dull yellow, while the other sex is fuscous with a dull yellow border and base. The pubescence is more permanent than usual in species possessing it, and I have never seen a specimen without it, no matter how old.

Occurs from Pennsylvania to Kansas and Texas, rare in Massachusetts (Blanchard).

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A. prodromus Brahm.—Oblong, moderately convex, black, shining; sides of thorax and elytra pale yellow, the latter with an elongate fuscous space narrow near the humerus and broader posteriorly; legs yellow. Antennæ testaceous, club fuscous. Head feebly convex, the male with slight elevation at middle, surface smooth with a few nearly obsolete coarse punctures near the sides ♂, sparsely finely punctate ♀. Clypeus hemihexagonal, very broadly feebly emarginate, the angles rounded, sides arcuate, genæ moderately prominent, subacute. Thorax slightly narrower in front in both sexes, the sides more arcuate in the male, hind angles well defined, the apex slightly obtuse, base arcuate with fine marginal line; disc more convex in the male, the middle nearly smooth with a few coarse punctures toward the hind angles, in the female less convex, with only the anterior portion of the middle region smooth, otherwise with moderately coarse sparse punctures. Elytra as wide at base as the thorax, humeri distinct, but obtuse, striæ moderately deep, moderately coarsely crenately punctate, the intervals convex with few sparsely placed fine punctures ♀, or densely punctate on each side ♂. Mesosternum opaque each side, smoother at middle. Metasternum yellow at middle, sides opaque, sparsely punctate. Abdomen sparsely obsoletely punctate. Anterior tibiæ smooth in front, tridentate externally and crenate above. the first tarsal joint shorter than the second. Posterior femora almost entirely smooth, a few coarse punctures near the knee, the first tarsal joint nearly as long as the next three. Length .22-.30 inch; 5.5.-7.5 mm.

Male.—Front slightly more convex at middle. Head and thorax with very few punctures. Anterior tibial spur stout, suddenly flexed inwards at tip. Elytral intervals densely punctulate at their sides, smooth only at middle. Posterior femora stouter.

Female.—Front evenly convex. Head and thorax with numerous punctures. Anterior tibial spur slender, acute, nearly straight. Intervals with very few punctures.

In both sexes the metasternum is yellow, flat, with a median longitudinal sulcus, deeper in the male, the flat region around the groove is closely and coarsely punctured in the male and very sparsely punctate in the female.

The elytral pubescence is quite fine and easily abraded, but more permanent than in *Walshii*, and less distinct than in *femoralis*. The present species is larger than *femoralis*, more shining, and with more yellow and less fuscous on the elytra.

Occurs very commonly in Europe, and in our country has been collected by Prof. Fernald in Maine. I have a specimen from Montreal, Canada.

A. tenuistriatus n. sp.—Form rather slender, as in *stercorosus*, moderately convex, entirely rufotestaceous, feebly shining. Head feebly convex, front without trace of tubercles, surface finely alutaceous, sparsely punctulate; clypeus very feebly emarginate in front, the angles rounded, sides oblique, very feebly arcuate, the genæ not at all prominent. Thorax distinctly narrowed in front, the sides feebly arcuate, margin fimbriate, hind angles well marked, but obtuse; base arcuate with fine marginal line; disc moderately convex, very sparsely

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punctate at middle, with a few coarser punctures intermixed at sides. Elytra as wide at base as the thorax, humeri distinct, but obtuse; sides parallel, disc very finely striate, striæ scarcely visible, punctate, intervals flat, rather coarsely and closely biseriately punctate, each puncture bearing a short pale hair, elytral margin with short fimbriæ. Mesosternum finely alutaceous, opaque. Metasternum and abdomen sparsely punctate. Anterior tibiæ smooth in front, tridentate externally, crenate above, the first tarsal joint longer than the second. Posterior femora sparsely finely punctate, posterior tibiæ rather stout, first tarsal joint not quite as long as the next three. Length .16 inch, 4 mm.

In the nine specimens examined there have been no sexual differences observed.

This species is remarkable in the very fine scarcely punctured elytral striæ with the intervals very conspicuously biseriately punctate.

Occurs in southwestern Texas.

Group M.

Scutellum small. Head not tuberculate, clypeus broadly emarginate, bidenticulate in *oblongus*. Mesosternum, at most, feebly carinate between the coxæ. Thorax broader in front than posteriorly, the hind angles apparently obliquely truncate. Elytra narrower at base than at middle, the humeral angles dentiform.

In this group I have united the species formerly separated into groups N and O, as there does not seem to be any special reason for retaining them apart. In describing the species the base of the thorax is called "oblique each side near the hind angles," while in the above general characters the hind angles are said to be "obliquely truncate." The meaning is really the same. although some might be disposed to consider the oblique portion a part of the *base*, others of the *side* of the thorax.

The species are thus separable:

Elytra oblong; mesosternum obsoletely carinate.
  Clypeus feebly emarginate, a small acute tooth each side.....**oblongus.**
  Clypeus feebly emarginate, angles broadly rounded.....**sparsus.**
Elytra oval; clypeus feebly emarginate with rounded angles.
  Thorax with numerous coarse and deep punctures; elytral striæ fine, but deep; punctures fine.....**ovipennis.**
  Thorax with very few coarse punctures; elytral striæ fine with conspicuously large and distant punctures.....**humeralis.**

A. oblongus Say.—Oblong, moderately elongate, slightly broader posteriorly, piceous black, shining, legs brownish. Antennæ brown, club darker. Head moderately convex, front without trace of tubercles, surface sparsely, rather

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finely punctate at middle, more coarsely and densely at the sides. Clypeus broadly feebly emarginate, at middle a small, acute, reflexed tooth each side; sides strongly arcuate, genæ prominent, but obtuse. Thorax nearly twice as wide as long, distinctly narrower posteriorly; sides arcuate, hind angles distinct, but obtuse; base arcuate at middle, oblique near the hind angles, the marginal line distinct, disc moderately convex, coarsely sparsely punctate with finer punctures intermixed and more closely punctured near the sides. Elytra as wide at base as the thorax, wider posteriorly, humeri dentiform, striæ deep and subcrenately striate, the intervals slightly convex, very sparsely finely punctulate. Mesosternum coarsely and densely punctate, obtusely carinate between the coxæ. Metasternum at sides and abdomen sparsely punctate. Anterior tibiæ smooth in front, tridentate externally, the teeth rather small and in the apical third of the tibia, above crenate, first tarsal joint as long as the second. Posterior femora sparsely punctate, the first tarsal joint longer than the three following. Length .28-.36 inch; 7-9 mm.

Male.—Anterior tibial spur short, truncate and slightly emarginate at apex, the inner angle slightly prolonged. Upper spur of middle tibia short, slightly curved.

Female.—Anterior tibial spur acute.

As may be observed in many species, the thorax of the female has more numerous punctures.

This is one of the largest of our native species, and is easily known by the thorax narrower behind, the form of clypeus, the feebly carinate mesosternum and the unequal spinules of the hind tibia.

Occurs from Pennsylvania to Colorado. A specimen in the cabinet of Amer. Ent. Soc. is marked Arizona.

A. sparsus Lec.—Elongate, moderately convex, slightly wider posteriorly, piceous black, shining; legs reddish brown. Antennæ pale. Head moderately convex, front not tuberculate, sparsely punctulate at middle, a few coarser punctures near the side. Clypeus broadly, but feebly emarginate, the angles broadly rounded, sides arcuate, genæ moderately prominent, subacute. Thorax twice as wide as long, distinctly narrower posteriorly, sides arcuate, hind angles obtuse, base arcuate, on each side near the angles sinuate, the marginal line entire and deep, disc moderately convex with numerous very coarse punctures irregularly scattered, more closely placed near the base and sides with much finer punctures intermixed. Elytra narrower at base than the thorax, somewhat broader posteriorly, humeri dentiform, the striæ moderately deep and coarsely punctured, intervals slightly convex, with few indistinct fine punctures. Mesosternum coarsely punctate, feebly shining, distinctly carinate between the coxæ. Metasternum sparsely finely punctate at sides, abdomen with scarcely a trace of punctures, alutaceous and slightly rugose. Anterior tibiæ smooth in front, tridentate externally and not crenate above, the first tarsal joint a little longer than the second. Posterior femora sparsely punctate, the first tarsal joint as long as the next three. Length .26 inch; 6.5 mm.

The only specimen before me is a female, probably; the spur of the anterior tibia is slender and acute.

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This species has almost exactly the form of *oblongus*, and is much more closely related to it than *ovipennis*, with which Dr. LeConte compares it. Probably by a *lapsus calami* the mesosternum was described as not carinate.

California, Mariposa region.

A. ovipennis Horn.—Oblong, convex, reddish brown or piceous, shining. Antennæ and palpi reddish brown. Head moderately convex, without trace of tubercles, moderately closely finely punctured, a few coarser punctures above the eyes. Clypeus broadly emarginate in front, the angles rounded, sides arcuate, slightly sinuate, genæ prominent, subacute. Thorax nearly twice as wide as long, distinctly narrowed posteriorly, sides arcuate, hind angles almost obliterated, base very feebly arcuate, but very oblique at the sides, the basal marginal line deep; disc moderately convex with very coarse and deep punctures sparsely placed at middle, closer toward the sides and dense in the front angles, with extremely fine punctures in the intervals. Elytra oval, narrower at base than the thorax, humeri dentiform, the striæ fine, but moderately deep, finely not closely punctured, the intervals nearly flat on the disc and extremely finely sparsely punctulate, more convex near the apex. Mesosternum coarsely closely punctate, a narrow smooth space at middle, not carinate between the coxæ. Metasternum sparsely punctate at the sides. Abdomen very finely sparsely punctulate, at sides wrinkled. Anterior tibiæ smooth in front, tridentate externally, not crenate above, the first tarsal joint shorter than the second. Posterior femora sparsely punctate, the first tarsal joint longer than the next three. Length .30–.34 inch; 1.5–8.5 mm.

The two specimens at present before me are probably males. The spur of the anterior tibia is short, stout and curved inwards.

This species recalls the *nevadensis* group in its general form, although the elytra are still more oval and the humeri more dentiform. The unequal spinules of the hind tibiæ of the present species will easily separate it from any of that series.

Heretofore this species has been placed as a synonym of *cadaverinus* Mann., but with the insufficiency of the description of the latter I can see no reason for adopting this view. There are at least two species in group G., *gentilis* and *cribratus*, either of which might be the synonym, and which occur in the maritime regions of California, while *ovipennis* is only known from the distant interior, from which Mannerheim could hardly have obtained specimens at that time.

Occurs at Fort Tejon, California.

A. humeralis Lec.—Oblong, robust, convex, black, shining. Head moderately convex, without trace of frontal tubercles, finely alutaceous, not punctulate. Clypeus broadly feebly emarginate, angles broadly rounded, sides oblique, genæ prominent, subacute. Thorax very convex, transverse, narrower behind, sides feebly arcuate, hind angles almost obliterated, base feebly arcuate with deep marginal line, the sides near the hind angles obliquely sinuate; disc con-

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vex, a few scattered large punctures, smooth in front. Elytra oval, narrower at base than the thorax, humeri prominently dentiform, striæ rather fine, but deep, with very large, round distant punctures, intervals slightly convex, smooth. Mesosternum coarsely punctured, not carinate between the coxæ. Length .14 inch; 3.5 mm.

The above is virtually a copy of the original description. From my memory of the type it is really impossible to say whether it should be referred to this or the *nevadensis* group. In any event it may be known by the large and distant punctures of the finer elytral striæ.

Occurs at Detroit, Mich.; a second specimen has been taken in Maryland by Mr. Ulke.

A. (Oxyomus) **cadaverinus** Mann.—Oblongus, supra nigro, subtus rufopiceus, clypeo profunde emarginato, thorace anterius dilatato, varioloso, elytris punctato-striatis. Longit. 3 lin. Lat. 1¾ lin.

Habitat in California, *Trogium* instar in cadaveribus exsiccatis. D. *Eschscholtz.*

The above is the entire description, and there is nothing to guide one as to its position except that the thorax is dilated in front and variolose, pointing in a manner either to the *nevadensis* group or that immediately preceding.

OXYOMUS Cast.

This genus was considered by Erichson a division of Aphodius, and the same view was adopted by Lacordaire, although the latter author remarks that the mouth parts make a passage toward Ammœcius and Psammodius.

The only obvious character separating it from Aphodius is found in the costate elytra. The costæ are quite acutely elevated, while the striæ are replaced by broad grooves often so coarsely and closely punctured that the bottom seems divided transversely by small partitions.

The only species known to our fauna has been introduced.

O. porcatus Fab.—Oblong, parallel, moderately convex, brownish piceous, opaque. Antennæ and palpi rufotestaceous. Head feebly convex, sparsely finely punctate. Clypeus hemihexagonal, the angles obtuse, sides feebly arcuate, genæ moderately prominent, obtuse. Thorax one-half wider than long, not narrowed in front, anterior angles obtuse, sides scarcely arcuate, hind angles well defined, but obtuse; base arcuate, but slightly irregularly, the marginal line absent; disc convex, the median line broadly sulcate behind the middle, surface moderately coarsely, but not closely punctured, the punctures finer in front. Elytra as wide

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at base as thorax, humeri slightly dentate; disc moderately convex, the sutural and nine discal intervals elevated in acute costæ, the sutural, first, second, fourth and sixth and eighth are entire, the others abbreviated, the striæ are replaced by the broad grooves between the costæ and are coarsely closely punctate. Mesosternum alutaceous, sparsely, coarsely punctate, finely carinate between the coxæ. Metasternum and abdomen sparsely coarsely punctured. Anterior tibiæ tridentate externally, not crenate, the first tarsal joint very little longer than the second. Posterior femora sparsely punctate, alutaceous, the tibiæ slender, the oblique carinæ feeble, the apex fimbriate with unequal spinules, the first tarsal joint longer than the next three. Length .10-.12 inch; 2.5-3 mm.

The male has the metasternum longitudinally impressed.

This insect is one of the smallest Aphodides in our fauna. The acutely costate elytra will readily separate it from any Aphodius, and the structure of the legs from either Atænius or Dialytes. It has evidently been introduced from Europe, where it is common, but in our country has been found near the cities of New York and Philadelphia.

DIALYTES Harold.

The essential difference between this genus and Aphodius is in the form of the anterior tibiæ. The outer teeth, excepting the external apical are obsolete, existing only in the faintest trace, and in addition there is a tooth in front near the insertion of the tarsi.

The structure of the mouth parts is the same as in Aphodius. The head, although deflexed, allows the eyes to be partly visible. Other characters given by Harold as the dentate humeri and the feeble oblique carinæ of the posterior tibiæ are found in various members of the genus Aphodius.

The species are three in number, and are thus defined:

Intervals of elytra flat; clypeus not toothed.....**truncatus.**
Intervals finely carinate, striæ catenulate; clypeus with an acute tooth each side.....**Ulkei.**
Intervals strongly elevated; clypeus not toothed, thorax with a deep median impression.....**striatulus.**

All these species belong to the eastern portion of the Atlantic region.

D. truncatus Mels.—Oblong, broader behind, convex, piceous black, shining, legs brownish. Antennæ ferruginous. Head moderately convex, rather coarsely sparsely punctate. Clypeus hemihexagonal, broadly feebly emarginate in front, the angles obtuse, sides oblique, genæ obtuse. Thorax one-fourth wider than long, narrower in front, anterior angles rectangular, sides slightly sinuous, hind angles well defined, but obtuse; base arcuate, on each side near the hind angles oblique and sinuous, the marginal line distinct, disc convex, punctures moderately coarse, sparse at middle, closer at sides and base. Elytra as wide at

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base as thorax, the base arcuately emarginate, humeri prominently dentate, disc convex, finely striate, striæ with fine not close punctures, intervals flat, smooth, at apex costiform. Mesosternum opaque, coarsely punctate, a smooth elevated line in front, not carinate between the coxæ. Metasternum moderately punctate. Abdomen obsoletely coarsely punctate. Posterior femora sparsely punctate, the tibia with feeble ridges, the first tarsal joint longer than the next three. Length .22–.24 inch; 5.5–6 mm.

No sexual differences have been observed. Differs from either of the other two species by the flat elytral intervals and shining surface.

Occurs from Canada (Pettit) to Maryland; also in Massachusetts (Blanchard).

D. Ulkei Horn.—Oblong, broader behind, convex, sericeous opaque. Antennæ ferruginous. Head coarsely not closely punctate. Clypeus hemihexagonal, broadly emarginate in front with an acute reflexed tooth each side, the sides oblique, the genæ small, obtuse. Thorax nearly one-half wider than long, not or very slightly narrowed in front, the anterior angles rectangular, sides feebly arcuate, slightly undulating, hind angles well defined, not obtuse; base arcuate at middle, very oblique and sinuate each side, the marginal line distinct; disc convex, the median line vaguely impressed, surface coarsely and closely punctured, very densely at sides. Elytra a little wider than the base of the thorax, the base feebly emarginate, humeri prominently dentiform; disc convex, the striæ fine, catenulately punctured, on each side of the stria a very fine carina, the intervals elevated at middle in a fine carina, at the sides the spaces between the carinæ are bicatenulate. Mesosternum opaque, sparsely punctate, with a smooth fine carina in front. Metasternum coarsely punctate at middle, more finely at the sides. Abdomen sparsely indistinctly punctate. Posterior femora sparsely punctate, the tibiæ slender, the oblique carinæ feeble, the first tarsal joint longer than the next three. Length .24 inch; 6 mm.

A very pretty species in its peculiar surface lustre and elytral sculpture.

Occurs at Deer Park, Maryland.

D. striatulus Say.—Oblong, slightly broader behind, convex, piceous brown, opaque. Antennæ ferruginous. Head moderately coarsely punctate, closely behind and at sides, more sparsely at middle. Clypeus hemihexagonal, feebly emarginate, the angles obtuse, genæ very small. Thorax very little wider than long, slightly narrowed in front, anterior angles rectangular, sides nearly straight or very slightly sinuous, hind angles well defined, but obtuse; base arcuate at middle, very oblique and sinuate each side, basal marginal line absent; disc convex, the median line broadly and deeply impressed, not reaching the apex, surface coarsely cribrately punctured. Elytra as broad at base as the thorax, base emarginate, the humeri not dentate, but slightly prominent in front; disc convex, the intervals elevated in acute carinæ, the space between them concave with a row of indistinct coarse punctures. Mesosternum opaque, coarsely rugose. Metasternum coarsely, closely punctate. Abdomen opaque, somewhat rugose, each segment coarsely crenate in front. Posterior femur sparsely punctate, tibiæ slender, the first tarsal joint as long as the next four. Length 16.–.20 inch; 4–5 mm.

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This species seems to bear the same relation to the others of the genus that *Oxyomus porcatus* does to the mass of Aphodii. In looking at the thorax from above, the sides of the base are so very oblique that the effect is produced of the thorax being rather abruptly coarctate at base.

Occurs from Canada and New England States to Maryland and Illinois.

ATÆNIUS Harold.

This genus was suggested by Baron Harold in 1867 for certain species previously placed in Euparia. The following are the characters given:

Head convex, not tuberculate. Mandibles concealed, the molar tooth distinct, laminæ membranous. Maxillary lobes membranous. Eyes usually concealed, ventral segments united, the terminal separated from the preceding by a deeper groove. Mesosternum carinate. Pygidium free, deflexed. First joint of hind tarsus elongate, of the anterior tarsus, longer than the second. Posterior tibiæ simple, without transverse carinæ, straight. Allied to *Euparia*, differs by the posterior tibiæ not arcuate, metasternum not abbreviated, sides of thorax not explanate.

The outer apical angle of the hind tibiæ is always more prolonged than in *Aphodius*, and often spiniform. In all or nearly all the species the sides of the thorax are fimbriate, but the hairs are so easily lost and often so short that no account is taken of them in the following descriptions. The mesosternum is usually furnished with an obtuse polished carina between the coxæ, but this is not present in several species and feeble in others. The metasternum at middle has a deep groove, present in all the species. The first joint of the anterior tarsus is always longer than the second. The pygidium is in part exposed beyond the elytra and is divided by a transverse elevated line, the exposed portion below this line is eroded and usually filled with dirt, the portion above is finely punctured, and has a deep median groove into which an inflexed edge of the elytron is inserted in the manner already indicated for *Ochodæus*.

The sculpture of the elytra in many of the species is peculiar in the appearance of the striæ. These appear often coarsely punctured, when a look into the striæ shows that the punctuation is really fine and distant, the deception arising from the sides of the intervals being crenate. It will also be observed that this crenation is entirely independent of the punctures of the striæ and not caused by them.

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Among the characters used in the following tables and descriptions one requires special mention. In Col. Hefte xii, 1874, p. 15, Harold makes use of the "accessory spinule of the middle and posterior tibiæ" in separating groups of species. This spinule is a prolongation of the apical margin of the middle and posterior tibiæ on the under side adjacent to the spurs. There is no difficulty in detecting it after a few observations.

Since the publication of the synopsis in 1871, a few species have been described by Baron Harold, and some new forms have been gradually accumulating in my cabinet. In the succeeding pages, among the new species, two only are described from uniques,—*insculptus* and *læviventris;* of the old species *oblongus*, *lucanus* and *puncticollis* remain unique.

The following table will assist in the determination of the species. In some instances it has been made unusually full from the difficulty in recognizing the species in some parts of the series.

Clypeus subangulate, sometimes denticulate each side of the median emargination ..... 2.
Clypeus feebly emarginate, the angles each side broadly rounded ..... 5.
2.—Marginal line of posterior femur deep and entire ..... 3.
Marginal line very short or absent ..... 4.
3.—Posterior tibia without accessory spinule; front not rugulose at sides.
Surface subopaque; first joint of posterior tarsus very much, nearly twice, longer than the long spur ..... **insculptus.**
Surface shining; first joint of posterior tarsus not longer than the long spur.
Thorax densely punctured from apex to base; intervals of elytra subacutely carinate ..... **cylindrus.**
Thorax nearly smooth in front, coarsely, less densely punctured posteriorly; intervals nearly flat ..... **Lecontei.**
Posterior tibia with accessory spinule; front rugulose at sides; elytra subovaI, intervals subcostiform ..... **lucanus.**
4.—Posterior tibia without accessory spinule.
First joint of posterior tarsus as long as the long spur; species piceous or nearly black.
Thorax densely punctured from base to apex ..... **abditus.**
Thorax densely punctured near base, almost smooth in front. **texanus.**
First joint of posterior tarsus shorter than the long spur and evidently thicker near apex; ferruginous or brownish species.
Thorax coarsely, sparsely and irregularly punctured, with finer punctures intermixed; abdomen with very few punctures ..... **desertus.**
Thorax closely and regularly punctured, a little more finely in front; abdomen coarsely punctured ..... **inops.**
Posterior tibia with accessory spinule; thorax as in *desertus;* abdomen smooth, without punctures ..... **læviventris.**

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5.—Opaque species; thorax without basal marginal line; head densely finely punctured, not rugulose; posterior tibiæ without accessory spinule.
Elytral intervals flat.....**imbricatus.**
Elytral intervals alternately more elevated.....**alternatus.**
Shining species; thorax with basal marginal line .....6.
6.—Posterior tibiæ without accessory spinule 7
Posterior tibiæ with accessory spinule.....12.
7.—Pale reddish brown species.
Striæ of elytra punctulate, intervals smooth.....**socialis.**
Striæ impunctate, intervals biseriately punctulate.....**puncticollis.**
Piceous or black species .....8.
8.—Head simply punctulate, not rugulose .....9.
Head wrinkled and rugose at the sides .....11.
9.—Elytral intervals very flat; abdomen nearly smooth at middle..**Wenzelii.**
Elytral intervals convex; abdomen coarsely punctured.....10.
10.—Elytra oblong oval, base slightly emarginate; form rather robust; marginal line of posterior femur entire.....**ovatulus.**
Elytra elongate, parallel, base truncate; form slender, elongate; marginal line of posterior femur very short or absent.....**gracilis.**
11.—Form slender; thorax coarsely sparsely punctate; abdomen nearly smooth; marginal line of posterior femur absent.....**figurator.**
12.—Intervals of elytra very flat, densely punctured, the punctures nearly as coarse as those of the thorax; form short and robust; marginal line of posterior femur abbreviated.....**robustus.**
Intervals convex, rarely punctate .....13.
13.—Abdomen coarsely punctured from side to side.....14.
Abdomen coarsely punctate at sides, finely or nearly smooth at middle....15.
14.—Elytral striæ catenulate punctate; head densely punctured; posterior femur coarsely punctate, the marginal line entire.....**oblongus.**
Elytral striæ simply punctate; head wrinkled in front, without coarse punctures on occiput; posterior femur nearly smooth, the marginal line short.....**inquisitus.**
15.—Elytra smooth, not pubescent.....16.
Elytra with short erect hairs arising from punctures .....21.
16.—Clypeus finely punctured, without traces of rugæ; occiput with coarse punctures; posterior femur with deep marginal line extending two-thirds to base .....**strigatus.**
Clypeus transversely wrinkled or coarsely punctured .....17.
17.—Elytra parallel, the base nearly squarely truncate; abdomen with numerous coarse punctures at the sides, fewer and finer at middle. .....18.
Elytra somewhat oval, distinctly emarginate at base. .....20.
18.—Posterior femur with deep, marginal groove extending from knee nearly half to base; thorax without coarse punctures antero-medially.
stercorator.
Posterior femur with at most a fine and feeble marginal line near the knee, usually absent .....19.
19.—The coarse punctures of thorax moderate in size, the finer intermixed, punctures very distinct.....**cognatus.**
The coarse punctures of thorax large, the finer punctures scarcely evident.
californicus.

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20.—Abdomen with very few punctures at side, smooth at middle; marginal line of posterior femur feeble and indistinct..... **lobatus.**
21.—Abdomen with few punctures; marginal line of femur short...**hirsutus.**

A. insculptus n. sp.—Oblong, moderately convex, black, feebly shining. Antennæ and palpi reddish brown. Head convex, densely and rather coarsely punctured in a transverse space on the occiput, in front very finely and indistinctly punctured. Clypeus at middle broadly, but feebly emarginate; on each side a small acute denticle, the sides arcuate, genæ moderately prominent, obtuse. Thorax nearly twice as wide as long, slightly narrowed posteriorly; sides feebly arcuate, hind angles very obtuse, base arcuate, the basal marginal line fine and distinct, disc moderately convex, a slight depression each side, the surface moderately coarsely punctured, the punctures denser toward the sides, rugose near the front angles, finer and sparser behind the head. Elytra as wide at base as the thorax, humeri dentiform, sides arcuate, disc deeply striate, striæ catenulately punctured, intervals with a finely elevated carina along their middle. Mesosternum scabrous, opaque, with a shining obtuse carina between the coxæ. Metasternum opaque, subgranulate at the sides. Abdomen finely alutaceous, feebly shining, coarsely, but sparsely punctured over their entire surface, segments 2-5 crenate along their anterior border. Anterior tibiæ tridentate externally, not crenate. Posterior femur coarsely sparsely punctate and alutaceous, the posterior marginal groove entire and deep, the tibiæ without accessory spinule, the first tarsal joint much longer than the long spur. Length .16-.18 inch; 4-4.5 mm.

Of this species I have seen but two specimens, collected in Florida. The species was supposed by Dr. LeConte (Proc. Am. Philos. Soc. 1878, p. 402) to be *sculptilis* Harold, and although it agrees fairly with the description of that species there is no accessory spinule at the inner angle of the apex of the hind tibia. It is most closely allied among our species to *cylindrus* Horn (Hornii *Har.*).

Two specimens, Florida.

A. lucanus Horn.—Form rather robust, brownish, moderately shining. Antennæ rufotestaceous. Head convex, coarsely not closely punctate in a transverse band posteriorly, sparsely obsoletely punctate at middle and distinctly rugulose at the sides in front. Clypeus broadly emarginate, the angles of emargination distinct, the sides oblique, slightly arcuate, genæ prominent, but obtuse. Thorax less than twice as wide as long, slightly narrower behind (when viewed from above) sides feebly arcuate, the margin crenulate, hind angles distinct obtuse, base arcuate, the marginal line deep and entire; disc convex, coarsely and closely, not densely punctured, the puncture a little finer near the apical margin. Elytra as wide as the thorax, slightly oval, humeri dentiform, disc deeply striate, striæ not punctured, intervals rather acutely convex and with a row of fine punctures on each side below the apex. Mesosternum carinate between the coxæ, rather roughly scabrous in front. Metasternum coarsely and densely punctured at the sides. Abdomen piceous, coarsely sparsely punctured over the entire surface, segments 2-5 crenate in front. Anterior tibiæ tridentate externally, obsoletely crenate above. Posterior femora coarsely sparsely punctate, the posterior marginal moderately deep and entire, the tibia with distinct accessory spinule, the first tarsal joint not longer than the long spur. Length .16 inch; 4 mm.

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The characters given above and in the table make this one of the most sharply defined species in our fauna. It associates very naturally in facies and in the greater part of its characters with the three species which precede, but is readily known by the presence of a short, but distinct accessory spinule to the hind tibiæ.

One specimen, Cape San Lucas, Lower California, in the LeConte cabinet.

A. cylindrus Horn.—Elongate oval, moderately convex, piceous or black, moderately shining, legs reddish brown. Antennæ pale rufotestaceous. Head moderately convex, punctulate, the punctures at occiput coarser, at sides finer, the middle of clypeus nearly smooth. Clypeus broadly emarginate and slightly impressed at middle, an acute denticle each side, the sides arcuate, genæ moderately prominent, obtuse. Thorax about one and a half times as wide as long, the sides feebly arcuate, apex and base equal, hind angles obtuse, base arcuate at middle, oblique each side near the hind angles, the basal marginal line distinct, disc moderately convex, rather densely punctate, the punctures very little finer to the front. Elytra elongate oval, the base as wide as thorax, humeri slightly dentiform, surface deeply and broadly sulcate-striate, the striæ indistinctly coarsely punctured, the intervals acutely elevated. Mesosternum opaque, densely and finely punctured, a polished carina between the coxæ. Metasternum closely, but indistinctly punctate at the sides. Abdomen feebly shining, sparsely punctate at middle, more coarsely at the sides, the segments 2–5 crenate along their anterior border. Anterior tibiæ acutely tridentate externally, subcrenate above. Posterior femora sparsely punctate, the posterior marginal line entire, the tibia without accessory spinule, the first tarsal joint not longer than the long spur. Length .14–.16 inch; 3.5–4 mm.

The special characters which distinguish this species from those most closely related are given briefly in the table, and need not be repeated.

Occurs from North Carolina to Florida.

A. texanus Harold.—Similar in form to *abditus*, and very closely resembling it, except in the following characters: Surface more shining. Thorax less closely punctate posteriorly, the punctures becoming rapidly finer in front, so that the disc is nearly smooth behind the apical margin. Elytra rather less deeply striate, the striæ crenately punctured, the intervals less convex than in *abditus* and crenate on the inner side by the punctures of the striæ, the row of punctures on the outer side of the intervals very fine and scarcely evident near the apex. Length .16 inch; 4 mm.

This species so closely resembles *abditus* in all essential characters that one may suspect them to be merely variations, as may eventually be the case with *cylindricus* and *LeContei*.

Occurs in Texas and Arizona.

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A. desertus Horn.—Oblong oval, slightly broader behind, moderately convex. rufoferruginous or pale brown, moderately shining. Head moderately convex, not closely punctate, anteriorly granulate and rugose. Clypeus broadly, but feebly emarginate, angulate each side and with a small erect denticle, sides arcuate with a feeble sinuation posteriorly, genæ feebly prominent, obtuse. Thorax twice as wide as long, not narrowed in front, sides feebly arcuate, hind angles very obtuse, base arcuate with a deep marginal line, disc moderately convex, with coarse and moderately deep punctures very irregularly scattered with a few finer punctures intermixed, a space near the side comparatively smooth, a few conspicuously large punctures near the front angles. Elytra as wide at base as the thorax, humeri finely dentate, sides slightly arcuate, disc deeply striate, crenate-punctate, intervals convex, smooth, crenate on the inner side. Mesosternum opaque, finely rugulose, carinate between the coxæ. Metasternum smooth. Abdomen very sparsely punctulate. Anterior tibiæ tridentate externally, obsoletely crenate above. Posterior femora sparsely finely punctulate, a short marginal line near the knee; posterior tibiæ without accessory spinule, the first tarsal joint shorter than the long spur. Length .12–.18 inch; 3–4.5 mm.

Among the species with dentate clypeus the present is readily known by its color and the very irregular coarse punctuation of the thorax. One other species of the group has the latter character but this has a distinct accessory tibial spinule. The ventral segments have the crenation along the anterior margin as is usual in the genus.

Occurs in California, near Fort Yuma; in Arizona; also in southern Utah.

A. abditus Hald.—Form slender, elongate, parallel, subdepressed, piceous, moderately shining, legs pale reddish brown. Antennæ and palpi rufotestaceous. Head moderately densely punctured posteriorly, smoother at middle, roughly punctured or subgranulate in front. Clypeus broadly, but feebly emarginate, a distinct angulation or small denticle each side, the sides arcuate, genæ moderately prominent obtuse. Thorax not quite twice as wide as long, slightly narrower posteriorly, the sides feebly arcuate, the hind angles rounded, base arcuate, the marginal line well marked, disc moderately convex, a slight depression at the anterior angles, the punctures moderate in size, closely placed, a little finer in front, dense toward the sides, especially in the front angles. Elytra as wide as the thorax, humeri dentate, sides nearly parallel, moderately deeply striate, striæ rather coarsely crenate-punctate, intervals moderately convex, with a series of finer punctures on the outer side of each ventral. Mesosternum opaque, strigose punctate in front, carinate between the coxæ. Metasternum coarsely sparsely punctate at middle, more rugose and finely at the sides. Abdomen coarsely punctate, sparsely at middle, more elevated at the side. Anterior tibiæ tridentate externally and feebly crenate above. Posterior femora sparsely punctate or nearly smooth, with at most a feeble trace of a marginal line near the knee; posterior tibia without accessory spinule, the first tarsal joint not longer than the long spur. Length .14–.16 inch; 3.5–4 mm.

This species seems widely distributed on the American Continent, specimens from Columbia, S. A., having been described by Harold

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as *attenuator*. The latter is said to have the front angles of the thorax reddish (Col. Hefte xii, p. 22), but the type kindly given me is quite black all over, and it is probable that the specimen described may have been immature. Notwithstanding the wide distribution of this species it seems to vary but little.

Occurs from Massachusetts (Blanchard) to every point west and south, California and Arizona, thence through Mexico to South America. It has not yet occurred in our northwestern regions.

A. Lecontei Harold.—Form of *cylindrus*, piceous or black (reddish brown when immature), moderately shining, legs reddish brown. Antennæ rufotestaceous. Head moderately convex with coarser punctures along the occiput, the front and clypeus finely obsoletely punctured. Clypeus impressed in front, broadly, but feebly emarginate, slightly angulate each side, the sides arcuate, the genæ feebly prominent, obtuse. Thorax similar in form to *cylindrus*, the punctures rather coarse, not densely placed, except at sides; in front with few punctures. Elytra oblong oval, humeri dentiform, as wide at base as the thorax, striæ deep and rather broad, the punctures coarse, not serrate, intervals convex, subcarinate at apex and with a row of indistinct punctures on the inner side below their apices. Mesosternum opaque rugulose, carinate between the coxæ, Metasternum indistinctly punctate at sides. Abdomen coarsely sparsely punctate, segments 2–5 crenate in front. Legs as in *cylindrus*. Length .14–.16 inch; 3.5–4 mm.

This species is closely allied to *cylindrus*, but has the elytral intervals much less carinate on the disc, the thorax is more coarsely and less densely punctured and the punctures are very much sparser behind the anterior margin.

Occurs from the District of Columbia to Louisiana.

A. inops n. sp.—Moderately elongate, parallel, feebly convex, reddish brown, shining. Head moderately convex, the occiput indistinctly punctate, entire front granulate. Clypeus broadly feebly emarginate; a small, acute tooth each side; sides arcuate, genæ feebly prominent, obtuse. Thorax about one and a half times as wide as long, not narrowed in front, sides very regularly, but feebly arcuate, hind angles broadly rounded, base arcuate the marginal line fine, disc moderately convex, the punctures not coarse, but very regularly and moderately closely placed, a little finer near the front, and with a smoother space near the hind angles. Elytra as wide as the thorax, humeri finely dentate, sides parallel, disc striate, striæ punctured, intervals feebly convex, crenate on their inner edge and with a row of very fine punctures on the outer side. Mesosternum opaque, finely strigoso-punctate, carinate between the coxæ. Metasternum finely punctate at middle, slightly rugose at sides. Abdomen rather coarsely punctate, the punctures finer and sparser at middle, denser at sides. Anterior tibiæ tridentate externally, not crenate above. Posterior femora almost entirely smooth, a short trace of a marginal line near the knee; posterior tibiæ without accessory spinule, the first tarsal joint shorter than the long spur. Length .14–.16 inch; 3.5–4 mm.

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This species and *desertus* are approximated in the table by the comparatively short first hind tarsal joint. They also agree quite closely in color, but differ in the punctuation of the thorax, which, in the present species, resembles *abditus* in habitus.

Occurs in Arizona near the southern boundary, also in Texas.

A. læviventris n. sp.--Oblong, moderately elongate and convex, piceous brown, shining. Antennæ rufotestaceous. Head moderately convex, sparsely punctate, punctures along the occiput coarser, anteriorly and at the sides granulately rugose. Clypeus slightly impressed in front, at middle broadly, but feebly emarginate, angulate each side, sides oblique, slightly arcuate, genæ moderately prominent obtuse. Thorax less than twice as wide as long, base and apex equal, sides feebly arcuate, hind angles very obtuse, base arcuate with fine marginal line; disc moderately convex with coarse punctures sparsely irregularly placed at basal half and at the sides, the intervals between these with few finer punctures, the apical portion of the disc, immediately behind the head, without coarse punctures. Elytra as wide at base as the thorax, humeri rectangular not dentate, sides nearly parallel, the striæ deep, crenately punctate, the punctures crenating the inner side of the interspaces, the interspaces feebly convex on the disc, more convex at apex, with few extremely fine punctures. Mesosternum opaque and punctulate, subcarinate between the coxæ. Metasternum almost entirely smooth. Abdomen very smooth, with a very few extremely fine punctures, the segments 2-5 as usual, crenate in front. Anterior tibiæ tridentate externally, crenate above. Posterior femora scarcely punctulate, the marginal line deep and reaching more than half from the knee to trochanter, the posterior tibia with a moderately long accessory spinule, the first tarsal joint a little shorter than the long spur. Length .20 inch; 5 mm.

This species has a greater resemblance to the species associated with *stercorator* than to any of those with the angulate clypeus. While the clypeus is very plainly angulate each side it has not the small reflexed tooth of many of the species. The almost absolutely smooth abdomen is a character possessed by but few species among those at present known to me.

One specimen, southern Arizona (Morrison).

A. imbricatus Mels.—Oblong oval, moderately convex, piceous opaque, the surface usually covered with a brownish cinereous coating, elytral intervals with a single row of short scale-like hairs, legs brownish. Antennæ and palpi pale rufotestaceous. Head moderately convex, densely punctate, the punctures across the occiput coarser, those of the front slightly longitudinally strigose; clypeus at middle nearly smooth. Clypeus feebly impressed in front; broadly, but feebly emarginate, the angles broadly rounded, sides broadly arcuate, genæ feebly prominent, obtuse. Thorax nearly twice as wide as long, slightly narrower posteriorly, the sides in front arcuate, the posterior two-thirds nearly straight, hind angles very obtuse, base broadly arcuate without trace of basal marginal line, disc moderately convex, the punctures rather coarse and closely placed at base and sides a little finer in front, but at best faintly visible from the coating of the

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surface. Elytra as wide at base as the thorax, humeri acutely dentate, sides arcuate, striæ moderately deep, the punctures rather coarse, not closely placed indistinct, intervals flat, the third, fifth and seventh a little more elevated near the apex, each with a row of fine punctures bearing a small scale-like yellow hair. Mesosternum opaque, rather coarsely punctate, carinate between the coxæ. Metasternum densely punctate. Abdomen coarsely punctate and rugulose, the segments as usual, crenate in front. Anterior tibiæ acutely tridentate externally. subcrenate above, the first tarsal joint nearly as long as the next three. Posterior femur coarsely sparsely punctate, the posterior marginal line deep and entire, the posterior tibia without accessory spinule, the first tarsal joint one-fourth longer than the long spur. Length .16–.18 inch; 4–4.5 mm.

The surface of this species being concealed in great part by the argillaceous coating, the sculpture is often so concealed as to be with difficulty observed. The legs are often reddish brown, but usually piceous. There will be no difficulty in recognizing this species and *alternatus* in the genus, by their surface coating, the absence of marginal line at the base of the thorax and the deep and entire marginal line of the posterior femur.

In distribution this species seems to be nearly equal with *abditus*, as specimens have been collected in Mexico, Cuba, Honduras and Brazil. On specimens from these regions Harold described his *sordidus*, which is simply a synonym, as has been determined by a typical specimen sent to Dr. LeConte by Sallé.

In our fauna it extends from Massachusetts to Texas.

A. alternatus Mels.—Very like *imbricatus* in form and color. Head densely punctured, the punctures equal, at sides more rugose. Clypeus and genæ as in *imbricatus*. Thorax also similar in form, but with the base undulate, not regularly arcuate, the marginal line absent. Elytra also similar in form, finely striate, striæ with rather distant, inconspicuous punctures, the intervals slightly convex, the alternate ones 1–3–5–7 more acutely elevated along the middle and cariniform. Mesosternum opaque rugulose, carinate between the coxæ. Metasternum closely punctate. Abdomen sparsely punctate from side to side, the punctures as well as the crenations often obscured by the surface coating. Anterior tibiæ tridentate externally, crenate above. Posterior femur sparsely punctate, the marginal line feeble near the knee, gradually evanescent internally, the posterior tibia without accessory spinule, the first tarsal joint nearly a third longer than the long spur. Length .14–.18 inch; 3.5–4.5 mm.

This species seems to be much rarer than than *imbricatus*. In the description in my Synopsis it is stated that the striæ are not punctate, and in many specimens this will, apparently, be true, as the coating of the surface so often hides smaller points of sculpture. From *alternatus* this species differs in the carinate intervals, the feeble marginal line of posterior femur and rather longer first hind tarsal joint.

Occurs from Pennsylvania to Texas.

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A. socialis Horn.—Moderately elongate and parallel, feebly convex, rufo-ferruginous or pale castaneous, shining. Antennæ pale rufotestaceous. Head short and broad, less convex than usual, dissimilarly sculptured in the sexes. Clypeus broadly truncate and feebly emarginate, the sides arcuate, genæ very prominent, but obtuse. Thorax nearly twice as wide as long ♂ or less than that ♀, the sides arcuate, more feebly in ♀, hind angles very broadly rounded, the sides and base forming a continuous line, base arcuate, the marginal line very fine; disc moderately convex, dissimilarly sculptured in the sexes. Elytra as wide at base as the thorax, humeri not dentate, striæ deep, crenately punctate ♂ or less punctate ♀, intervals moderately convex, smooth. Mesosternum opaque, densely punctate, not carinate between the coxæ. Metasternum smooth. Abdomen with extremely few fine punctures, the segments crenate in front. Posterior femora sparsely punctate, without marginal line ♂, or with feeble nearly entire line ♀. Length .18-.20 inch; 4.5-5 mm.

Male.—Head broader and shorter, the genæ arising rectangularly from the head, surface sparsely and finely punctate. Thorax nearly twice as wide as long, the disc moderately convex, irregularly sparsely punctate, the punctures fewer in front and less numerous near the sides. Anterior tibiæ slender, bidentate* externally, the apical spur incurved at tip.

Female.—Head less transverse, moderately closely punctate, rugose in front and at the sides, more distinctly emarginate at middle. Thorax less transverse than in the ♂, the sides less arcuate, disc rather more convex, the punctures coarser, more numerous, gradually finer anteriorly. Anterior tibiæ normal in form, tridentate externally, not crenate above, the terminal spur shorter and simple.

At the time of the first description of this species I had seen but two females, which were sent by Sallé to Dr. LeConte under the manuscript name which I adopted, hence my failure to recognize the remarkable sexual differences afterwards indicated by Harold (Berl. Zeitschr. 1874, p. 174).

The species is otherwise so remarkable that I translate Harold's remarks: "The posterior tibiæ are without transverse ridges, a character which forbids its association with *Aphodius*, and allies it with *Atœnius*, *Saprosites* and *Euparia*. On the middle tibia there is, however, a transverse ridge, in which it resembles *Saprosites*. *Saprosites* is characterized by the relatively short tarsi and the denticulate middle tibiæ, characters to which the graceful and slender tibiæ and tarsi of *A. socialis* are foreign. If, therefore, one does not desire to create a new genus for every aberrant form our choice of position must be between *Atœnius* and *Euparia*. The short and transverse head with the prominent genæ suggest *Euparia;* the posterior tibiæ

* Apropos of this character Harold remarks that but one Aphodiide is known to him with this character *Aph. fulviventris*. Among our Aphodius several have the upper tooth either entirely or partially obliterated, as will be seen by reference to the preceding pages.

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straight and slender, the genæ continuous, with the clypeus not separated by an incisure, give weight to an association with *Atænius*, from which it however differs by the non-carinate mesosternum and remarkable sexual characters which bespeak for it an isolated position in the genus."

These comments by Harold are certainly very true, yet all has not been said. The eyes are larger than usual in the genus and not concealed from the front when the head is deflexed. The maxillary palpi are also longer and the terminal joint slender, not thicker at middle as usual in the other species. It will also be observed that the terminal joint is fully twice as long as the penultimate in the ♀, the penultimate in the ♂ is two-thirds the length of the terminal.

With all these structural differences I think, with Harold, that it is far better to consider *socialis* an aberrant Atænius than to coin a new name.

Harold described the species under the same name as that used by me, he apparently not knowing the existence of my paper.

Occurs in Georgia, Louisiana and Texas.

A. puncticollis Lec.—Moderately elongate, parallel, ferruginous brown, moderately shining. Antennæ rufotestaceous. Head moderately convex, rather coarsely rugose, not more coarsely punctured posteriorly. Clypeus feebly emarginate at middle, broadly rounded each side, the sides oblique slightly arcuate, genæ feebly prominent, obtuse. Thorax less than twice as wide as long, sides nearly parallel, feebly arcuate, hind angles obtuse, base arcuate, the marginal line distinct, disc moderately convex, the punctures not coarse, but moderately closely placed, becoming gradually finer in front. Elytra as wide at base as the thorax, humeri distinct, but not dentiform, finely striate, striæ not punctured, the intervals flat, irregularly biseriately punctulate. Abdomen sparsely punctate, the punctures finer at middle. Anterior tibiæ tridentate externally, not crenate above. Posterior femora smooth, with trace of a short marginal line near the knee; posterior tibiæ without accessory spinule. Length .16 inch; 4 mm.

The type and unique specimen of this species is in such bad state that I am unable to give some desirable details of the under side. While an inconspicuous species, it is allied only to the female of *socialis*, from which it may be separated by the characters in the table. The striæ are not punctured, but the punctures on the inner side of the intervals give these a crenate appearance, and may deceive a casual glance with the belief that the striæ are punctured.

One specimen, El Paso, Texas.

A. Wenzelii n. sp.—Moderately elongate and convex, parallel, piceous black, shining, legs reddish brown. Antennæ rufotestaceous. Head convex, moderately densely punctate, the punctures coarser across the occiput and very

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fine and sparse at the middle of the front. Clypeus broadly feebly emarginate, the angles broadly rounded, sides arcuate, genæ moderately prominent, obtuse. Thorax one and a half times as wide as long, apparently narrowed slightly at base, sides feebly arcuate, hind angles broadly rounded, base arcuate, the marginal line distinct, disc moderately convex, the punctures coarse and close at the basal half, denser and finer at the front angles, the punctures at middle gradually finer from the basal toward apical margin. Elytra as wide at base as the thorax, the humeri slightly dentate, surface moderately deeply striate, striæ not distinctly punctate, intervals very flat in front, cariniform on the apical declivity, the inner sides deeply crenate, the surfaces finely indistinctly punctulate near the base. Mesosternum coarsely punctured and opaque in front, not carinate between the coxæ. Metasternum sparsely punctulate. Abdomen sparsely punctate, coarsely at sides, finely at middle, the segments crenate in front. Anterior tibiæ acutely tridentate externally, subcrenate above. Posterior femur smooth without trace of a posterior marginal line, the posterior tibia without accessory spinule, the first tarsal joint a little longer than the long spur. Length .18 inch; 4.5 mm.

A well marked species in the present series by the very flat elytral intervals, with less lustre than would be expected from one so black, from the fact that the surface of the elytral intervals is extremely finely alutaceous. At first glance the striæ would seem to be punctured, but the inner sides of the intervals are deeply crenate causing that appearance.

It is well to observe that in this species the usual obtuse, polished carina is not present between the middle coxæ. While there can be no doubt that the present species is a true *Atœnius*, the absence of the carina here makes a similar character in *socialis* less remarkable.

Taken at Atlantic City by Mr. Henry Wenzel, to whom I dedicate the species as an evidence of my appreciation of the kind help at all times given me from his cabinet. Occurs also in Florida (cab. LeC.) one in my cabinet marked Colorado, which may be open to doubt.

A. ovatulus Horn.—Form rather robust and moderately convex, recalling *Lecontei*, piceous black, moderately shining, legs brownish. Antennæ rufotestaceous. Head moderately convex, densely and rather coarsely punctured, the punctures becoming rapidly finer to the front and at the sides. Clypeus slightly impressed in front; broadly, but feebly emarginate at middle, the angles broadly rounded, sides arcuate, genæ obtuse. Thorax about one and a half times as wide as long, apparently slightly narrower posteriorly, sides feebly arcuate, hind angles obtuse, base arcuate, with a slight sinuation near the angles; disc moderately convex, the punctures at middle coarse, rather close, becoming finer to the front, at sides densely punctured and opaque. Elytra as wide at base as the thorax, elongate oval, humeri finely dentate, sides moderately arcuate, striæ deep, transversely not closely punctate, intervals very convex, subcarinate at apex, with indistinct punctures on the inner side below the apex of each interval. Mesosternum opaque, coarsely punctured, carinate between the coxæ. Metasternum coarsely punctured. Abdomen coarsely, not densely, punctured from side to side,

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the sides crenate in front. Anterior tibiæ tridentate externally, the teeth not large, above obsoletely crenate. Posterior femur sparsely punctate, the posterior marginal line entire, the tibia without accessory spinule, the first tarsal joint a little longer than the long spur. Length .14 inch; 3.5 mm.

Closely allied in form and sculpture to *Lecontei*, and in a less degree to *cylindrus*, but differs, especially, from either by the form of the clypeus. It is also related to *vexator* Har., a species from the West Indies and Brazil, which is, however, larger and with different elytral sculpture.

Occurs from Pennsylvania to Louisiana.

A. gracilis Mels.—Form slender, elongate, parallel, subdepressed, piceous black, legs piceous or brownish, tarsi paler, moderately shining. Antennæ and palpi rufotestaceous. Head moderately convex, closely punctate, the middle of front and anterior portion of clypeus smoother, the punctures across the occiput coarser. Clypeus slightly impressed in front, at middle broadly, but feebly emarginate, on each side broadly rounded, the sides arcuate, genæ moderately prominent. Thorax one and a half times wider than long, apparently a little narrower posteriorly, sides moderately arcuate, hind angles broadly rounded, base arcuate, the marginal line very distinct, disc moderately convex, a distinct depression in the front angles, a feebler one at middle of declivity, median line posteriorly obsoletely impressed, punctures moderately coarse and rather close, somewhat denser at the sides, a little finer toward the front, but somewhat closer. Elytra as wide as the thorax, humeri slightly dentate, sides parallel, striæ deep and broad, not distinctly punctured, the intervals convex, almost cariniform, with a series of catenuliform elevations on each side below the summit, those on the inner side more distinct. Mesosternum opaque, coarsely punctured, strongly carinate between the coxæ. Metasternum coarsely sparsely punctate. Abdomen similarly punctured, the last segment smoother, the segments crenate in front. Anterior tibiæ tridentate externally, not crenate above. Posterior femur sparsely punctate, the posterior marginal line entire, the tibia without accessory spinule, the first tarsal joint longer than the long spur. Length .12-.16 inch; 3-4 mm.

A small species of slender parallel form, and feeble surface lustre, widely distributed over our territory, exhibiting very little variation, except slightly in the sculpture of the thorax. The carination of the prosternum in front of the coxæ is more acute than usual, and the post-coxal laminiform elevation better marked.

Occurs from Massachusetts (Blanchard) to Arizona and California, and has been, like *abditus*, found in Mexico, South America and the West India Islands.

A. figurator Harold.—Elongate, parallel, feebly convex, piceous black, shining; legs piceo-rufous, tarsi paler. Antennæ rufotestaceous. Head moderately convex, coarsely punctured across the occiput, sparsely finely punctured at middle, coarsely punctured rugose and somewhat wrinkled at the sides. Clypeus impressed in front, broadly feebly emarginate, on each side with broadly rounded

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angles, sides feebly arcuate, genæ very obtuse. Thorax one and a half times as wide as long, not narrowed posteriorly, the sides feebly arcuate, hind angles very obtuse, base arcuate, the marginal line distinct, disc moderately convex, the punctures coarse, sparsely and irregularly placed, less numerous near the base, an entirely smooth space near the hind angles. Elytra as wide at base as the thorax, humeri scarcely dentate, sides parallel, striæ rather coarsely crenate punctate, intervals flat, smooth. Mesosternum in front opaque and punctured, the intercoxal carina short and indistinct. Metasternum smooth. Abdomen smooth, either entirely without punctures or with a very few fine and indistinct. Anterior tibiæ tridentate externally, not distinctly crenate above. Posterior femora smooth without marginal line, the tibia without accessory spinule, the first tarsal joint a little longer than the long spur. Length .14-.16 inch; 3.5-4 mm.

Through the kindness of Baron Harold I have received a typical specimen of this species, and can therefore be certain of the identification of the specimens before me. Harold describes the striæ as "finely punctate," but in a small insect, like the present, where the punctures occupy nearly as great a space as the intervals, between them should be called "rather coarsely crenate punctate." The present species has been compared with *Haroldi* Steinh., from the Argentine Republic, which has the clypeus slightly angulate each side of the emargination, and the punctures of the thorax deeper. Two specimens in my cabinet from the Indian Territory and Arizona have a suspicion of an angulation and the punctures of the thorax deeper and more numerous, the striæ less deep and finely punctured. I am, however, unwilling to consider these *Haroldi* without comparison, and do not think it advisable to give them a new name merely for the locality differences. Their existence in our fauna is indicated so that they may be recognized by those possessing them.

Occurs in Georgia, Louisiana and Texas.

A. robustus Horn.—Oblong oval, moderately convex, facies robust, black, subopaque; legs piceo-rufous. Antennæ piceous. Head moderately convex, rather coarsely and densely punctured, except at middle of front, the sides rugose, but not transversely wrinkled. Clypeus impressed in front; broadly, but feebly emarginate, broadly rounded each side, the sides oblique, feebly arcuate, genæ moderately prominent, subacute. Thorax twice as wide as long, slightly narrow at base, sides feebly arcuate, hind angles broadly rounded, base arcuate, the marginal line fine, but distinct; disc moderately convex, very densely and rather finely punctured over the entire surface, except a narrow smooth median line posteriorly. Elytra as wide as the thorax, not more than one and a quarter times longer than wide, humeri rather strongly dentate, sides arcuate; disc finely, but rather deeply striate, striæ indistinctly punctate, intervals very flat, densely punctured, the punctures nearly as coarse as those of the thorax. Mesosternum opaque, rather coarsely punctured, intercoxal carina very indistinct. Body beneath more shining than above. Metasternum coarsely sparsely punctate. Abdomen coarsely sparsely punctate, the segments crenate in front. Anterior

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tibiæ strongly tridentate externally, crenate above. Posterior femora sparsely punctate, the marginal line extending from the knee to middle, tibia with distinct accessory spinule, the first tarsal joint elongate, but not longer than the long spur. Length .18 inch; 4.5 mm.

Next to *socialis* this species is one of the most remarkable in our fauna, without, however, possessing any very striking structural characteristics. In facies it resembles *Notibius gagates*, a Tenebrionide. Its form is shorter and broader than any Atænius in our fauna, and the dense and very equal punctuation of the entire upper surface is a peculiarity by means of which it may be at once known.

Its distribution is peculiar and restricted, and it seems rare. Specimens are known from Wisconsin, Missouri and Kansas.

A. oblongus Horn.—Oblong, nearly parallel, black, feebly shining. Head convex, densely punctate, the punctures coarser on the occiput and gradually finer in front, clypeus at middle much smoother. Clypeus broadly, but feebly emarginate, on each side rounded, the sides arcuate, genæ feebly prominent, obtuse. Thorax nearly twice as wide as long, sides nearly parallel, feebly arcuate, hind angles distinct, but obtuse; base arcuate, the marginal line distinct and deep, disc moderately convex, the punctures rather closely placed, a little finer to the front and much denser at the sides. Elytra as wide at base as the thorax, the humeri sharply dentiform, disc deeply striate, striæ catenulate, intervals convex, the inner intervals with a series of closely placed punctures each side of the summit of the carina, the outer intervals more densely punctulate at their sides from apex to bottom. Mesosternum carinate between the coxæ, anteriorly densely punctulate and opaque. Metasternum coarsely punctured at middle, scabrous and opaque at the sides. Abdomen very coarsely and closely punctate from side to side, the segments 2-5 crenate in front. Anterior tibiæ tridentate externally, crenate above. Posterior femora coarsely, but not closely punctate, the posterior marginal line deep and entire, the posterior tibia with distinct accessory spinule, the first tarsal joint longer than the long spur. Length .24 inch; 6 mm.

This species, in an arrangement according to facies, should be placed after *alternatus* and *imbricatus*, as it more nearly resembles these in form than the more shining species which follow. It is an easily known species, being the only one with simple clypeus with an accessory tibial spinule and entire marginal line to the posterior femora.

One specimen, California.

A. inquisitus n. sp.—Oblong oval, slightly broader behind, moderately convex, piceous or castaneous, shining, legs pale reddish brown. Antennæ pale rufotestaceous. Head moderately convex, sparsely punctate, sides of clypeus transversely wrinkled. Clypeus broadly, but feebly emarginate and impressed at middle, on each side broadly rounded, the sides oblique, feebly arcuate, genæ obtusely rounded. Thorax one and a half times as wide as long, not narrower behind, sides feebly arcuate, nearly straight, hind angles very obtuse, base arcuate, marginal line distinct, disc convex, with coarse punctures moderately

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closely placed at the declivous portion of the sides and more sparsely in a narrow region along the base, the median and anterior portion of the disc sparsely finely punctured. Elytra as wide at base as the thorax, sides arcuate and slightly wider posteriorly, humeri dentate, disc deeply striate, striæ finely punctured, intervals convex, but not carinate, crenate on their inner side, smooth. Mesosternum opaque, densely punctured, the intercoxal carina short. Metasternum sparsely punctate at sides. Abdomen coarsely punctured, less coarsely at middle, almost cribrate at the sides. Anterior tibiæ tridentate externally, crenate above. Posterior femora almost entirely smooth, the marginal line extending from knee half way to base, the tibia with distinct accessory spinule, the first tarsal joint a little longer than the long spur. Length .16-.18 inch; 4-4.5 mm.

With this species a series begins in which *stercorator* may be taken as the central form, and in which the species are very troublesome to separate. Of all of them large series have been studied in the material accumulated in the LeConte cabinet and my own with the results given in the synoptic table, in which the distinctive characters have been given at unusual length.

Occurs in southwestern Texas and probably also in Mexico.

Specimens closely resembling the preceding species are in the LeConte cabinet collected in Panama. The only appreciable difference is in the finer punctuation of the thorax of the Panama forms. They are probably not specifically distinct.

A. strigatus Say.—Oblong, parallel, moderately elongate and convex, piceous black, shining; legs somewhat paler. Antennæ rufotestaceous. Head moderately convex, extremely finely sparsely punctured without trace of rugæ, the occipital region with coarser punctures. Clypeus slightly impressed in front, broadly feebly emarginate, broadly rounded each side, the sides oblique, slightly arcuate, genæ moderately prominent, subacute. Thorax nearly twice as wide as long, slightly narrowed posteriorly, sides feebly arcuate, nearly straight, hind angles very obtuse, base arcuate, the marginal line distinct, disc moderately convex with coarse punctures sparsely placed in a narrow region along the base, never closely at the sides, the punctures of the anterior and middle regions very fine and sparse, almost entirely absent in front. Elytra as wide at base as the thorax, humeri dentate, sides parallel, disc deeply striate, striæ finely punctured, intervals feebly convex, crenate on both sides, smooth above. Mesosternum opaque, densely punctured in front, not carinate between the coxæ. Metasternum smooth at middle, slightly rugose at the sides. Abdomen coarsely punctate at sides, more finely at middle, the last two segments smooth at middle, the segments crenate in front. Anterior tibiæ tridentate externally, crenate above. Posterior femora smooth, the marginal line extending two-thirds from knee to base, the tibia with distinct accessory spinule, the first tarsal joint a little longer than the long spur. Length .18-.20 inch; 4.5-5 mm.

A specimen, which is presumed to be a male of this species, has the anterior tibia somewhat more slender and the spur incurved. The punctuation of the thorax is also finer and the sides of the intervals less crenate. The humeri are also less dentate.

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In my former synopsis the name *strigatus* was placed as a synonym of *stercorator*. This was the result of what I believe to be an incorrect identification of Say's species. The description of that author says "clypeus with very minute punctures and larger one at the base," and had there been any anterior rugæ they would have been indicated. It resembles the true *stercorator*, but differs in the frontal sculpture and the absence of the usual polished carina between the coxæ. A specimen kindly given me by Baron Harold as his idea of Say's species proves to be *cognatus* Lec.

Occurs from the Middle States to the Rocky Mountain region and south to Georgia.

A. stercorator Fab.—Oblong, moderately elongate and convex, piceous black, shining, legs rufopiceous or brown. Antennæ rufotestaceous. Head moderately convex, not very closely punctate, punctures coarser on the occiput, gradually finer to the front, the sides rugose and transversely wrinkled. Clypeus impressed in front, broadly emarginate at middle, on each side rounded, the sides feebly arcuate, genæ moderately prominent, subacute. Thorax one and a quarter times as wide as long, not narrowed behind, sides feebly arcuate, hind angles rounded, base arcuate, the marginal line rather deep, disc moderately convex, the punctuation rather coarse and sparse along the base, a little closer and coarser at the sides, these punctures with a few finer ones intermixed, the median and anterior portions of the thorax finely punctate. Elytra as wide at base as thorax, parallel, humeri with small tooth, disc deeply striate, striæ punctured, intervals feebly convex and on each side crenate, more distinctly on inner side. Mesosternum opaque, densely punctured, a moderately long intercoxal carina. Metasternum smooth. Abdomen coarsely punctured at the sides, very finely and sparsely at middle, the segments crenate in front. Anterior tibiæ tridentate externally, crenate above. Posterior femora sparsely finely punctate, the marginal line deep, extending from knee half to base, the the tibia with distinct accessory spinule, first tarsal joint a little shorter than the long spur. Length .20–.22 inch; 5–5.5 mm.

The above description is taken from specimens sent me some years ago by Dr. Candéze, and are from Buenos Ayres. The differences between it and the preceding species have already been alluded to. With the next species it seems even more closely related, and I can find only the differences alluded to in the table.

Among the numerous specimens of the group which are usually aggregated as *stercorator* in collections I have seen but one specimen in the cabinet of Dr. LeConte which can be considered a true *stercorator*. It seems, therefore, rare in our country.

One specimen, Florida.

A. cognatus Lec.—Oblong, parallel, moderately elongate and convex, piceous black, shining; legs reddish brown. Antennæ rufotestaceous. Head moderately convex, not densely punctate, the punctures coarser across the occiput,

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coarse at the sides and usually more or less wrinkled. Clypeus moderately impressed in front, broadly feebly emarginate, on each side broadly rounded, sides feebly arcuate, genæ moderately prominent, subacute. Thorax one and a half times as wide as long, sides feebly arcuate, hind angles rounded, base arcuate with deep marginal line, disc moderately convex, punctuation moderately coarse, sparsely and irregularly placed, a little closer near the sides, very little finer toward the front, with finer punctures everywhere intermixed. Elytra as wide at base as thorax, humeri dentate, sides nearly parallel, disc striate, striæ punctured, intervals slightly convex, smooth, more coarsely crenate on the inner side. Mesosternum densely punctured and opaque, indistinctly carinate between the coxæ. Metasternum with a few coarse punctures at middle, smooth at the sides. Abdomen with few coarse punctures at the sides, moderately smooth at middle, the segments crenate in front. Anterior tibiæ tridentate externally, obsoletely crenate above. Posterior femur almost entirely smooth, the marginal line short or absent, the tibia with distinct accessory spinule, the first tarsal joint a little longer than the long spur. Length .18–.20 inch; 4.5–5 mm.

This species varies a little in the sculpture of the head. In some the sides of the clypeus are simply coarsely punctured like the occiput, while in others the same region is distinctly wrinkled. The marginal line of the posterior femur varies from a fine impression about one-fifth of the length of the femur to a punctiform depression, and in nearly half the specimens is entirely absent.

From *strigatus* this species is known by the frontal sculpture and its extremely feeble frontal line; from *stercorator* by the latter character and by the coarse punctures of the thorax extending to the apical marginal; from the next species the differences are less describable and will be given under it.

The form supposed to be *strigatus* by Harold, is that with the sides of the clypeus punctate and not wrinkled.

Occurs from the New England States to the Rocky Mountains, Texas and Sonora.

A. californicus n. sp.—Oblong, parallel, moderately elongate and convex, piceous, shining; legs reddish brown. Antennæ pale rufotestaceous. Head moderately convex, punctures coarser but sparser along the occiput, very fine and sparse at middle of front, the anterior portion of clypeus and sides transversely wrinkled. Clypeus impressed in front; broadly, but feebly emarginate, the angles broadly rounded, sides oblique, feebly arcuate, genæ moderately prominent, obtuse. Thorax one and a half times as wide as long, not narrower posteriorly, sides feebly arcuate, marginal line deep, disc moderately convex, the punctures very coarse, but sparsely placed, a little closer near the front angles, more sparse at middle near the base, a little finer along the front margin, the finer intermixed punctures extremely minute. Elytra as wide at base as the thorax, humeri distinctly dentate, sides very slightly arcuate, disc deeply striate striæ finely not closely punctate, intervals flat, feebly convex at apex, smooth, the inner edges alone crenate. Mesosternum opaque, densely finely punctured,

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a distinct intercoxal carina. Metasternum smooth. Abdomen coarsely punctate at sides, smooth at middle, the segments crenate in front. Anterior tibiæ tridentate externally, crenate above. Posterior femur smooth, the marginal line absent, except a faint trace near the knee, posterior tibia with accessory spinule, the first tarsal joint as long as the long spur. Length .18 inch; 4.5 mm.

As will be seen by the characters of the table this species is most nearly allied to *cognatus*, and is the only one about which there should be any difficulty. On comparing the two the punctuation of the present is strikingly coarser on the thorax and the fine punctures extremely minute. In *cognatus* the intervals of the elytra are distinctly crenate on both sides.

Occurs at San Bernardino, Cal.

A. lobatus Horn.—Oblong oval, slightly broader behind, moderately convex, piceous brown, shining; legs reddish brown. Antennæ rufotestaceous. Head moderately convex, coarsely punctured along the occiput, at middle more sparsely finely punctate, at sides and front transversely wrinkled. Clypeus impressed in front, broadly emarginate at middle, the angles broadly rounded, sides slightly arcuate, genæ moderately prominent, obtuse. Thorax nearly twice as wide as long, not narrowed behind, sides feebly arcuate, hind angles very obtuse, base strongly arcuate, the marginal line distinct, disc moderately convex, with coarse and deep punctures rather sparsely placed along the base and at the sides with finer punctures intermixed, the middle and anterior portion of disc with very few coarse punctures and with fine punctures sparsely placed. Elytra as wide at base as the thorax, slightly broader behind, base arcuately emarginate, humeri dentate, disc deeply striate, striæ not closely punctured, intervals moderately convex and with few very fine punctures, the inner side finely crenate. Mesosternum densely punctured and opaque, carinate between the coxæ. Metasternum smooth. Abdomen with few obsolete coarse punctures at the sides, smooth at middle. Anterior tibiæ tridentate externally, crenate above. Posterior femur smooth, except a few large punctures near the knee, the marginal line fine, extending one-third toward base, the tibia with distinct accessory spinule, the first tarsal joint as long as the long spur. Length .22 inch; 5.5 mm.

This species has a more robust facies, is broader behind and more convex than any of the series to which it has closest relationship. The color is always piceous brown or dark castaneous but never piceous-black. While the thorax is more coarsely punctured than in *cognatus* it is less so than in *californicus*. The thorax is also more arcuate at base, and the base of the elytra correspondingly emarginate, while in the preceding species the elytral base is truncate.

While all the forms from *inquisitus* to the present species are closely allied and difficult to separate by description, they seem quite distinct and readily separable when the specimens are seen.

Occurs at Cape San Lucas, Lower California.

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A. hirsutus Horn.—Oblong, moderately elongate and convex, nearly parallel, ferruginous brown, feebly shining. Antennæ rufotestaceous. Head moderately convex, rather closely punctate, punctures coarse across the occiput, finer and sparser at middle, transversely wrinkled at the sides in front. Clypeus impressed in front, emarginate at middle, on each side less broadly rounded, sides arcuate, genæ feebly prominent, obtuse. Thorax twice as wide as long, slightly narrowed in front, sides anteriorly arcuate, posteriorly nearly parallel, hind angles rounded, base rather strongly arcuate with distinct marginal line, disc moderately convex, with intermixed punctuation of coarse and fine punctures, the coarse punctures numerous, but not dense along the base and sides, sparse and smaller at the anterior portion of the disc. Elytra as wide as the thorax, humeri slightly dentate, sides feebly arcuate, striæ deep, distantly punctured, intervals feebly convex, crenate on the inner side, summit with a row of fine punctures on the outer side, each bearing a short, erect, yellowish hair. Mesosternum opaque, rather coarsely punctured, carinate between the coxæ. Metasternum smooth. Abdomen coarsely sparsely punctured at the sides, smooth at middle, the segments crenate in front. Anterior tibiæ tridentate externally and subcrenate above. Posterior femur smooth, the marginal line fine, almost obsolete, extending half way to base, the tibia with accessory spinule, the first tarsal joint as long as the long spur. Length .16–.18 inch; 4–4.5 mm.

This species was originally described from two much mutilated specimens found dead and disarticulated. There are now two perfect specimens, from which the description can be more accurately given.

The clypeus is rather more deeply emarginate than usual in this series, so that when viewed directly from above there appears to be an angulation each side. There would, however, be no difficulty should the species be referred to the angulate series as the table would lead directly to *læviventris*, from which it is very easily known. The presence of the short erect hairs on the elytral intervals will make the species known wherever it may be placed. Occurs in Arizona, Camp Grant and southward.

EUPARIA Serv.

Head short, feebly convex, not tuberculate, eyes hidden in repose, genæ large. Mandibles concealed beneath the clypeus, the basal tooth compact, with membranous lamina. External maxillary lobe membranous, the inner corneous, the palpi slender, the last joint twice as long as the preceding. Thorax deeply emarginate in front, the sides deplanate and ciliate. Scutellum narrow, acute. Humeri of elytra prolonged to the front and strongly carinate. Pygidium slightly exposed, not inflexed. Legs slender, the middle and posterior tibiæ arcuate, the convexity internal, the posterior without ob-

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lique carinæ, the apical angle prolonged in a spiniform process, the spurs long and slender. Posterior tarsi slender, the first joint elongate, claws small.

This genus is closely allied structurally to Atænius, and the species of the latter were included in Euparia until separated by Harold in 1867. In fact the distance between the two genera is partly obliterated by *Atænius socialis*, and they would be made still closer by the separation of the latter as a distinct genus and the only advantage gained would be another name.

The only characters to be relied on in separating the two genera mentioned are in the form of the thorax (broad with deplanate margins) and the middle and hind tibiæ (arcuate in Euparia, straight in Atænius).

E. castanea Serv.—Oblong, parallel, convex, piceous shining, sparsely hairy, beneath and legs brown. Antennæ ferruginous. Head vertical in repose, coarsely, closely and roughly punctured in front, more sparsely and finely posteriorly. Clypeus at middle truncate and vaguely emarginate, on each side arcuate, an incisure at end of frontal suture, genæ very prominent, subacute. Thorax one-half wider than long, anterior angles rounded, sides slightly undulating, parallel, the margin explanate, widely in front, very narrowly behind, hind angles distinct, but obtuse, the base lobed at middle, suddenly sinuate near the angles, without basal marginal line, disc subgibbous at middle, sparsely muricately punctulate. the lateral margin quite smooth. Elytra much narrower than the thorax, base rather deeply emarginate, the humeral angles prominent to the front with an oblique carina forming a portion of the basal margin, the disc finely striate, striæ punctate, intervals flat, with numerous coarse punctures, which are somewhat muricate on the declivity, those punctures on the side intervals have a subbiseriate arrangement. Mesosternum opaque, rather roughly punctured in front. more sparsely behind, a fine carina between the coxæ. Metasternum nearly smooth. Abdomen sparsely muricately punctate. Posterior femur sparsely punctate, first joint of hind tarsus longer than the next three. Length .20 inch; 5 mm.

The entire surface of the body has short yellowish hairs arising from all the punctures, the legs are also sparsely hairy.

The form of this insect is so unlike any other species in our fauna as to make it readily known. The figure published by Westwood, although giving a good general idea of the insect, is far from accurate in many of the even important details.

Occurs in Florida, Alabama and Louisiana in the nests of a small ant.

RHYSSEMUS Muls.

In this genus the head is deflexed, the eyes invisible in repose. Labrum and mandibles concealed beneath the clypeus, the molar tooth of mandibles corneous. The maxillæ are membranous, the

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internal lobe corneous. Anterior tibiæ tridentate, middle and posterior tibiæ with feeble trace of oblique ridges. Tarsi slender, the first joint of the posterior elongate.

This genus is now almost universally admitted, although Thomson (Skand. Col. v) places the only species known to him in Psammodius. It seems, however, intermediate between Atænius and Psammodius.

All the species known to me have the lateral margin and base fimbriate with clavate spinules, in Psammodius they are simple hairs. As the character is common to all it is omitted in the description.

Our species are separated as follows:

Clypeus obtuse or rounded each side of emargination.
  Intervals of elytra with a row of small tubercles on the inner side, a continuous, finely elevated line on the outer..... .... **scaber.**
  Intervals with two rows of tubercles .... **californicus.**
Clypeus angulate or subdentate on each side.
  Intervals with a double row of nearly equal tubercles, vertex simple. **sonatus.**
  Intervals with a series of elevations, each tubercle with a scale-like hair, vertex with a transverse elevated line..... ....**riparius.**

The elytral sculpture is often very difficult to appreciate, and it is only by good, clear daylight that any description can be made with accuracy, but with artificial light under the power of a compound microscope very deceptive results are obtained.

Rh. scaber Hald.—Oblong, moderately convex, piceous opaque, legs brownish. Antennæ pale. Head moderately convex, granulate, the granules coarser at middle and in front, denser, finer and more opaque posteriorly. Clypeus moderately emarginate at middle, the angles rounded, sides arcuate, genæ very obtuse. Thorax one-fourth wider than long, slightly narrowed in front, anterior angles obtuse, sides arcuate, lateral margin not distinctly crenulate, hind angles broadly rounded, base arcuate with distinct marginal line, disc convex, densely granulate, with four discal equidistant transverse rows of larger tubercles, the anterior two entire, the posterior two interrupted, these larger tubercles more shining. Elytra as wide as the thorax, humeri slightly dentate, sides slightly arcuate, striæ fine, indistinctly catenulately punctured, the intervals with a row of elongate tubercles placed closely and slightly oblique on the inner side, a more elevated cariniform line on the outer side which is entire anteriorly, interrupted posteriorly. Mesosternum opaque, densely punctured, finely carinate between the coxæ. Metasternum smooth. Abdomen nearly smooth, the segments crenate in front, each with a transverse row of serrate punctures at middle. Posterior femora smooth, the marginal line fine and entire, first joint of hind tarsus nearly as long as the next three. Length .14–.16 inch; 3.5–4 mm.

In this species the thoracic sculpture has the most perfect development of any in our fauna, the transverse carinæ are well marked and the granules larger and more shining than those of the interspaces.

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The elytral sculpture is sufficiently explained above. On the front of the head a triangular space, from the vertex to the middle of the genæ each side, is smoother and the tubercles larger and more distant.

Occurs at the margin of streams from the Middle States to Texas.

Rh. californicus Horn.—Oblong, moderately convex, piceous opaque, legs brownish. Antennæ pale. Head moderately convex, granulate, the granules anteriorly coarser and more shining. Clypeus emarginate, the angles obtuse, sides oblique feebly arcuate, genæ obtuse. Thorax one-third wider than long, anterior angles obtuse, sides irregularly arcuate, lateral margin distinctly crenulate, hind angles very obtuse, base arcuate, the marginal line distinct; disc moderately convex, closely granulate with four discal transverse ridges, two entire, two interrupted as in *scaber*, the ridges very feebly elevated, the granules not coarser. Elytra as wide at base as the thorax, humeri distinctly dentate, disc finely striate, striæ indistinctly catenulately punctured, intervals flat, with two rows of granules, the inner granules more elongate and less closely placed, the outer row smaller and more closely placed, on the outer intervals the inner row of granules is indistinct. Mesosternum opaque, densely scabrous, finely carinate between the coxæ. Metasternum with few coarse punctures at middle, scabrous at the sides. Abdomen with an irregular transverse series of rather fine, closely placed punctures, each segment crenate in front. Posterior femur almost entirely smooth, the marginal line entire, first joint of hind tarsus as long as the next three. Length .12–.16 inch; 3–4 mm.

On comparing this species with *scaber* it will be observed that the thoracic ridges are less evident and the granules are not more coarse than those of the rest of the surface. The lateral margin is irregularly arcuate, and the extreme edge distinctly crenate. In the present species there are two distinct rows of tubercles on the intervals, while in *scaber* the outer row of tubercles forms an entire carina.

Occurs in southern California at the margin of streams, especially common near Visalia.

Rh. sonatus Lec.—Oblong, moderately convex, piceous black, opaque, elytra sometimes brownish, body beneath and legs reddish brown. Antennæ pale. Head densely, nearly equally granulate. Clypeus emarginate at middle, the angles each side well defined, rather acute, sides feebly arcuate, the genæ very obtuse. Thorax one-fourth wider than long, not narrowed in front, anterior angles obtuse, sides arcuate, the margin distinctly crenate, hind angles broadly rounded, base arcuate, the marginal line feeble, disc moderately convex, surface closely granulate, with four very indistinct, transverse, discal ridges composed of granules very slightly larger, the first ridge alone entire. Elytra as wide as the thorax, humeri slightly dentate, disc finely and indistinctly striate, the intervals with two nearly equal rows of slightly elongate tubercles. Mesosternum opaque, densely punctate, finely carinate between the coxæ. Metasternum slightly scabrous at sides. Abdomen nearly smooth, the transverse row of punctures scarcely visible on the segments, each segment crenate in front. Posterior femora smooth, the marginal line deep and entire, first joint of hind tarsus nearly as long as the next three. Length .12–.14 inch; 3–3.5 mm.

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The thoracic ridges are here still less distinct than in *californicus*. The elytral sculpture is, however, similar, except that in *sonatus* the striæ are less deep, while the granules of the intervals are nearly equal. The clypeus on each side of the emargination is nearly as distinctly angulate as in *Aphodius serval*, by which means this and the next species may be readily separated from the others.

Occurs in Kansas, Colorado and Montana.

Rh. riparius Horn.—Brownish black, oblong, moderately convex, opaque, legs brown. Antennæ pale. Head moderately convex, closely and relatively coarsely granulate, vertex with elevated arcuate line interrupted at middle, sometimes in form of chevron. Clypeus broadly emarginate at middle, on each side distinctly angulate. sides oblique, feebly arcuate, genæ obtuse. Thorax one-fourth wider than long, anterior angles obtuse, sides irregularly arcuate, margin crenate, hind angles broadly rounded, base arcuate, the marginal line indistinct, disc convex, rather coarsely granulate, with four indistinct, transverse discal ridges, the first only entire, a very distinct, broad, median sulcus from the first carina to base. Elytra as wide as the thorax, humeri slightly dentate, disc indistinctly striate, intervals with two rows of small tubercles, the inner scarcely evident, the outer distinct, each tubercle with a short yellow scale-like hair. Mesosternum opaque, densely punctured, a very fine and short median carina. Metasternum scabrous at sides. Abdomen sparsely punctate, each puncture with a scale-like hair, the segments crenate in front. Posterior femora sparsely punctate with scale-like hairs, the marginal line distinct, first joint of hind tarsi nearly as long as the next three. Length .12–.14 inch; 3–3.5 mm.

In this species the granules of the head and thorax are relatively coarser than in any of our species. The transverse ridges of the thorax are very feebly indicated, in fact the ridges are so broad that the narrow grooves separating them seem the feature of the sculpture. In my original description the grooves are spoken of to the exclusion of the ridges, but for the sake of uniformity and greater ease in comparison the same method of description has been adopted for all the species.

With this species I have united *cœlatus* Lec. On comparing the types I find them identical in every respect. At the time of the description of *cœlatus*, *riparius* was represented by an unique specimen and Dr. LeConte had no specimen at hand for comparison.

Occurs in Arizona from Camp Grant southward.

PLEUROPHORUS Muls.

This genus does not seem to have been admitted by the greater number of authors who have had occasion to deal with it since first suggested by Mulsant. The characters are rather feeble, but seem to possess fully as much value as those allowed to separate other genera in the group.

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The mouth parts are practically identical in Pleurophorus and Psammodius, and the anterior femur is as stout or stouter than the posterior. The middle and posterior tibiæ of Pleurophorus are slender, not thickened at tip, the spurs are slender as in Atænius, but less elongate. The posterior tarsi are slender, not compressed, the joints not triangular, the claws of normal size.

All the species of Psammodius have the side of the thorax fimbriate, but no such structure is seen in either of the Pleurophorus.

In Psammodius there is a feeble trace of the carina of the second ventral segment, but in no species so well marked as in Pleurophorus.

Two species are known to me:

Clypeus verrucose, thorax irregularly coarsely punctured, anterior femur emarginate beneath..... **cæsus.**

Clypeus finely sparsely punctate, thorax very regularly, not densely punctured, anterior femur entire..... **ventralis.**

P. cæsus Panz.—Form slender, elongate, piceous black, shining, subcylindrical, legs ferruginous. Antennæ pale rufotestaceous. Head moderately convex, a few coarse punctures along the occiput, in front verrucose. Clypeus broadly emarginate at middle, the angles obtuse, sides arcuate, genæ feebly prominent, very obtuse. Thorax about one-fourth wider than long, slightly broader in front, anterior angles obtuse, sides feebly arcuate, hind angles distinct, but obtuse; base arcuate, with distinct marginal line, disc moderately convex, a deep postapical groove beginning at the front angles, but not reaching the middle, a large round fovea at middle of declivity sometimes divided into two smaller foveæ, the median line impressed with coarse deep punctures, the surface very coarsely and irregularly sparsely punctured, a smooth space at the sides. Elytra a little narrower than the thorax, humeri obtuse not carinate; sides parallel, the striæ deep, punctate, intervals slightly convex, smooth, crenate on their inner border. Mesosternum opaque, rugulose, carinate between the coxæ. Metasternum smooth, deeply longitudinally impressed. Abdomen smooth, the segments crenate in front, the second segment carinate at middle. Anterior femur emarginate on its lower edge forming thereby two obtuse teeth. Posterior femur smooth, the marginal line fine, but entire; the tibiæ slender, spurs slender and long, tarsi long, the first joiut nearly as long as the next three. Length .12 inch; 3 mm.

This is one of the smallest Aphodiides in our fauna, very nearly of the same general form as *Atænius gracilis*, but rather more convex. The punctuation of the thorax is somewhat closer in some specimens, these may possibly be females, at all events no sexual characters have been observed otherwise.

In this species the first three elytral striæ only are entire and reach the apex.

Occurs abundantly in Europe, and probably introduced in our country, where it is found in the Middle States regions and occasionally abundantly near Baltimore (Lugger) and Washington (Ulke).

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P. ventralis n. sp.—Elongate, parallel, semicylindrical piceous, shining; legs reddish brown. Antennæ pale. Head convex, sparsely finely punctate. clypeus broadly truncate, angles obtuse, sides arcuate, genæ very obtuse, feebly prominent. Thorax one-fourth wider than long, very little wider in front, anterior angles obtuse, sides feebly arcuate, the margin very narrowly explanate, hind angles obtuse, base arcuate, with distinct marginal line, disc moderately convex, punctures moderate in size; sparsely, but very regularly placed, becoming gradually finer toward the front and sides, and with very few close to the base. Elytra a little narrower at base than the thorax, humeri slightly dentate, the striæ very deep and broad, the punctures large, indistinct and distant; intervals very convex, smooth. Mesosternum opaque, coarsely punctured with a fine median groove, acutely carinate between the coxæ. Metasternum with a small group of coarse crowded punctures. Abdomen smooth, the first three segments acutely carinate at middle, the fourth and fifth segments arcuately emarginate at middle of front margin, the notch with membrane. Anterior femur with lower edge entire. Posterior femur smooth, without marginal line, the tibia slender, with slender spurs; the tarsi nearly as long as the tibia, the first joint nearly as long as the next two. Length .16 inch; 4 mm.

This species has the same general form as the preceding, but is more convex. The ventral characters are very singular and have no parallel in our entire series. The carination of the first three segments is very plainly marked. The next two segments have a nearly semicircular emargination of the anterior margin occupying two-thirds the length of the segment and nearly the middle third of the width. The emargination is membranous. It is possible that the emargination may be a sexual peculiarity, although perfectly identical in the two specimens examined.

In this species the first five striæ of the elytra reach the apical margin, a character not observed in any other Aphodiide in our fauna.

In the sculpture of the thorax the species more nearly resembles Atænius, especially as there are no grooves or foveæ.

Occurs in Canada, Ontario, and at Washington (Ulke).

PSAMMODIUS Serv.

In this genus the outer lobe of the maxilla is corneous and terminated by stout curved spines or hooks, the internal lobe coriaceous. The mandibles are entirely concealed beneath the clypeus and are semimembranous, except that the base and the tooth are corneous. In repose the head is deflexed and the eyes concealed, the front is verrucose. The thorax is usually transversely grooved and coarsely punctate, but several species show no traces of this. The legs are never very stout, the hind tibiæ are generally triseriately denticulate,

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although several have distinct oblique ridges. The tarsi of the posterior legs are short, the joints flattened, the first elongate triangular, the last very short and small, the claws minute, often entirely lost, apparently by use.

As all the species have the margin of the thorax fimbriate with slender hairs no mention of this is made in the specific descriptions.

The species seem to indicate the affinities of the genus in three directions:—*bidens*, with the cylindrical forms of Aegialia and more remotely with Atænius—*ægialioides*, *quinqueplicatus* and especially *interruptus* with Rhyssemus, while *cælatus* and *hydropicus* resemble the robust Aegialiæ.

The maxillary structure is the only decisive character for separating the genus, but in our fauna the short compressed hind tarsi with triangular joints will readily distinguish it from either Rhyssemus or Pleurophorus.

Authors do not seem to be in accord as to the limits of the genus. Harold, in the Catalogus and later, includes Pleurophorus, but the characters of this seem to be as well defined as several other universally recognized genera and will be retained in the present essay as distinct.

The species known at this time, although few in number, are about as numerous as those found in Europe; they may be separated in the following manner:

Form oblong.....2.
Form short, elytra inflated..... 4.
2.—Clypeus with a small reflexed tooth each side of the broad emargination; disc of thorax comparatively smooth..... **bidens.**
Clypeus obtusely angulate each side; disc of thorax roughly sculptured.....3.
3.—Disc of thorax with transverse grooves more or less distinct.
Occiput with deep oblique grooves arranged in chevron; thoracic ridges sharply defined.....**ægialioides.**
Occiput without oblique grooves.
Elytral intervals convex with few or no simple punctures; color ferruginous moderately shining .....**quinqueplicatus.**
Elytral intervals with a series of indistinct flattened tubercles; color brownish, with a pale elytra, subopaque..... .....**interruptus.**
Disc of thorax very coarsely, irregularly and sparsely punctate; species very small.....**nanus.**
4.—Thorax with two deep transverse grooves at sides, the one post-apical, the other slightly in front of middle; posterior tibiæ with oblique ridges. **cælatus.**
Thorax without transverse grooves; posterior tibiæ without oblique ridges. **hydropicus.**

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Ps. bidens Horn.—Oblong, parallel, convex, piceous, shining, legs brownish. Antennæ rufotestaceous. Head closely, moderately coarsely verrucose. Clypeus slightly impressed in front, broadly emarginate, on each side a small acute reflexed tooth, the sides arcuate, a slight sinuation at end of frontal suture, genæ feebly prominent, obtuse. Thorax one-third wider than long, not narrowed in front, sides regularly arcuate, the margin feebly crenulate, anterior angles rounded, the posterior very obtuse, base arcuate, the marginal line distinct, disc moderately convex, a rather deep subtransverse impression in the front angles, a small fovea at middle of declivity, the surface sparsely punctate above, a smooth region along the apex, the sides broadly smooth. Elytra as wide at base as the thorax, humeri obtuse, sides nearly parallel, disc deeply striate, striæ indistinctly punctured at bottom, intervals convex, smooth, slightly crenate on their inner border. Mesosternum opaque, densely punctate, carinate between the coxæ. Metasternum slightly scabrous at sides. Abdomen coarsely sparsely punctate, the segments crenate in front. Posterior femora stout, nearly smooth, the marginal line very short, apical, the tibiæ stout, with one transverse carina near the apex, the spurs unequal, slender. Posterior tarsi longer than half the tibia, the first joint much broader at apex. Length .14 inch; 3.5 mm.

At first glance this species is not very unlike small specimens of *Aphodius granarius*. On comparison with the other species of the genus, this one is remarkable in the bidenticulate clypeus and the comparatively smooth thorax. All trace of the transverse impressions is lost, while the rather deep and irregular impression at the front angles recalls Atænius.

Occurs in Georgia and Florida.

Ps. segialioides Hald.—Oblong oval, slightly broader behind, convex, moderately shining, piceous, elytra and legs dark brown. Antennæ pale rufotestaceous. Head moderately convex, coarsely and closely verrucose, the occipital region with two deep angulate lines separated by an elevated ridge. Clypeus broadly triangularly emarginate, angles each side very obtuse, sides slightly arcuate, a slight notch at end of clypeal suture, genæ obtuse. Thorax one-third wider than long, slightly narrower in front, anterior angles very obtuse, hind angles distinct, but obtuse; base arcuate, the marginal line distinct, disc convex, with four well defined and convex transverse ridges, the first two entire, the last two interrupted by a median depression, the ridges smooth, the intervals between them coarsely punctured, a region along the side smooth. Elytra as wide at base as the thorax, humeri very obtuse, sides nearly straight, slightly divergent, the striæ moderately deep, not closely punctured, intervals slightly convex, smooth. Mesosternum opaque, densely punctured, not carinate between the coxæ. Metasternum slightly scabrous at sides. Abdomen almost absolutely smooth. Posterior femur stout, smooth, the marginal line moderately deep, reaching two-thirds to base, the tibia not stout, without oblique ridges, but with three longitudinal series of muricate tubercles, one on each of the edges, the third along the middle of the outer side, the spurs slender, but obtuse at tip, the tarsi not longer than half the tibia, the first joint elongate triangular. Length .16 inch; 4 mm.

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In the two specimens before me the last ventral segment is excavated along its anterior border in a manner similar to that of the pygidium of Atænius. The material at hand is not sufficient to enable me to determine whether the character is sexual or not.

The very sharply defined ridges of the thorax will enable this species to be at once determined, and the chevron-like ridges of the occiput are peculiar to it.

The ridges of the thorax are said to be four, but are apparently five, but no count is made of the thickened anterior margin of the thorax, the discal ridges are alone counted.

Occurs from New York southward to Georgia, but seems to be rare.

Ps. quinqueplicatus Horn.—Oblong oval, convex, slightly broader posteriorly, rufoferruginous, feebly shining. Head moderately convex, verrucose in front, the vertex and occiput with obsolete distant punctures. Clypeus broadly triangularly emarginate, the angles each side obtuse, the sides oblique, scarcely arcuate, genæ obtusely rounded. Thorax one-fourth wider than long, slightly narrowed in front, hind angles obtusely rounded, base feebly arcuate, the marginal line distinct, disc moderately convex with five distinct transverse ridges, the first two entire the others interrupted by a broad median impression, the grooves between the ridges coarsely punctured, a moderately large oval space at the hind angles smooth. Elytra as wide at base as the thorax, humeri slightly dentate, sides feebly arcuate, disc moderately deeply striate, the striæ punctured, intervals moderately convex, extremely finely alutaceous, the inner edges crenate. Mesosternum opaque, scabrous, not carinate between the coxæ. Metasternum with few punctures at sides. Ventral segments with a row of indistinct punctures. Posterior femora elongate oval, smooth, a marginal groove posteriorly extending two-thirds to base, posterior tibiæ moderately stout, without oblique ridges, but with the three longitudinal series of small acute tubercles, the spurs slender, but not acute at tip, tarsi longer than half the tibiæ, the first joint elongate triangular. Length .14 inch; 3.5 mm.

While there are but four discal ridges on the thorax in the preceding species there are five in the present. The last ventral shows no trace of the excavation seen in the preceding species. All the specimens studied, seven in number, have the same color.

The typical specimens in the LeConte cabinet were from the Mexican boundary survey and collected by Major Webb, the exact locality unknown. Those in my cabinet were collected by Morrison south of Tucson, Arizona.

Ps. interruptus Say.—Oblong, nearly parallel, moderately convex, thorax piceous, head and elytra brown, beneath and legs reddish brown. Head moderately closely verrucose. Clypeus broadly triangularly emarginate, the angles on each side very obtuse, sides feebly arcuate, genæ very obtuse. Thorax one-half

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wider than long, slightly narrowed in front, anterior angles obtuse, sides arcuate, the margin crenulate, hind angles well defined, obtuse; base arcuate with distinct marginal line; disc convex, with four very indistinct transverse ridges, the first entire, the others interrupted by a rather broad and deep median depression, surface otherwise granulate. Elytra as wide as the thorax, humeri distinct, not dentate, disc striate, striæ indistinctly punctured, the intervals flat with the inner side feebly crenate, each interval on the outer side with a row of very indistinct, elongate, flattened tubercles. Mesosternum opaque, densely punctured, not carinate between the coxæ. Metasternum smooth. Abdomen nearly smooth, a row of coarse punctures across the middle of each segment. Posterior femur elongate oval, an indistinct marginal line extending nearly the entire length, the tibia not stout, without oblique ridges, but with the usual triple series of acute tubercles, spurs slender, the tarsus three-fourths as long as tibia, the first joint elongate triangular. Length .14 inch; 3.5 mm.

This species has somewhat the facies of Rhyssemus, and is placed in the present genus from the form of the posterior tarsi. An examination of the maxillæ will be necessary to define its position with certainty, but with the material at hand that is not possible. The thoracic and elytral sculpture distinguish it from *quinqueplicatus*.

Occurs in the Middle States, Dacota and Texas, but rare.

Ps. nanus DeGeer.—Moderately elongate and convex, brownish, head and thorax often piceous, shining, legs pale. Head coarsely rugulose, slightly verrucose in front. Clypeus broadly triangularly emarginate, the angles each side obtuse, sides feebly arcuate, genæ obtuse. Thorax one-half wider than long, not narrower in front, the anterior angles obtuse, margin not crenate, sides feebly arcuate, hind angles very obtuse, base arcuate, the marginal line deep, disc convex, transverse impression at the front angles, another at middle of declivity, a slight median depression at base, surface with very coarse and deep, sparsely placed punctures, near the sides smooth. Elytra as wide at base as the thorax, humeri distinct, not dentate, disc deeply striate, striæ punctulate, intervals convex smooth, crenate on their inner borders. Mesosternum opaque, punctulate. Metasternum smooth. Abdomen almost entirely smooth, the segments crenate in front. Posterior femora smooth, the marginal line short, the tibiæ relatively slender, the anterior and posterior edges serrulate, the outer face smooth, spurs slender, subacute at tip, the tarsi as long as half the tibiæ, the first joint elongate triangular. Length .8–.10 inch; 2–2.5 mm.

This species is certainly the smallest lamellicorn in our fauna, and Baron Harold says that it is probably the smallest known. Its occurrence in our fauna was first indicated by Harold (Stett. Zeit. 1867, p. 282), but specimens were not known to me at the time of my synopsis.

Appears to be widely distributed, Harold records it from Chili, Mexico and Cuba; in our country I have seen specimens from Massachusetts (Blanchard), Texas, Arizona, California and Michigan (Schwarz).

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Ps. exclatus Lec.—Ovate, robust, broader behind, convex, piceous, shining; legs reddish brown. Antennæ pale. Head rather closely verrucose. Clypeus broadly triangularly emarginate, the angles each side obtuse, the sides arcuate, slightly sinuate before the genæ which are obtuse. Thorax fully twice as wide as long, not narrower in front, anterior angles obtuse, sides feebly arcuate, margin entire, hind angles obtuse, base arcuate, the marginal line rather deep, disc convex, a deep postapical groove, a second near the middle of the declivity extending upwards nearly to the median line of the thorax, the median line of thorax impressed posteriorly, the surface with very coarse deep punctures sparsely and irregularly placed, the sides quite smooth. Elytra oval, inflated, at base as wide as thorax, humeri rounded, disc deeply striate, striæ moderately closely punctured, intervals convex, smooth. Mesosternum opaque, scabrous. Metasternum short, smooth. Abdomen smooth, with an indistinct row of coarse punctures across each segment and a few, more distinct, at the sides. Posterior femora stout, oval, the marginal line distinct, a row of coarse setigerous punctures parallel with it, the tibiæ stout, smooth on the outer side, with two oblique ridges, the upper feeble, the lower well developed, the spurs cylindrical, but slender, obliquely truncate at tip, the tarsi short, the first joint elongate triangular. Length .12–.14 inch; 3–3.5 mm.

In a species like the present it is difficult to describe the thoracic sculpture in a manner to apply to even the majority of specimens. In a general way there are seen when viewed laterally two grooves, the first is immediately postapical and is entire, except for a short space at middle, the second groove is usually deeper and broader, extending from a short distance above the lateral margin toward the middle, but more widely interrupted than the first groove, the disc is thus divided into three unequal portions, the basal the broadest. The impression of the median line is also variable, the anterior portion is usually fine, the posterior filled with closely placed punctures.

The elytral striæ vary in punctuation in a manner suggestive of sexual difference, that is, some specimens are a little less inflated and have the striæ more distinctly punctured, others are more robust in form, the striæ rather finer and the punctures decidedly so. The body is apterous.

Occurs on the sea-shore near San Francisco, Cala.

Ps. hydropicus n. sp.—Ovate, much broader behind, convex, rufoferruginous, shining. Head coarsely and closely verrucose. Clypeus broadly and feebly triangularly emarginate, the angles on each side obtuse, sides arcuate, genæ scarcely prominent beyond the eyes. Thorax twice as wide as long, distinctly narrower in front, anterior angles obtuse, sides arcuate, the margin entire, hind angles broadly rounded, base arcuate, the marginal line entire, but fine and indistinct, disc convex, very shining, the surface somewhat irregular near the front angles, but without grooves, the upper portion of disc, sparsely punctate, the punctures coarse and indistinct. Elytra broadly oval, nearly as broad posteriorly as long, as broad at base as the thorax, humeri broadly rounded, disc striate,

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striæ deep and broad, indistinctly punctate at bottom, the lateral striæ less distinct than the dorsal, intervals convex, smooth. Mesosternum feebly shining, the surface slightly scabrous. Metasternum short, body apterous, the sides alutaceous. Abdomen alutaceous, each segment with a transverse row of indistinct setigerous punctures. Posterior femur elongate oval, the marginal line indistinct, the tibiæ stout, without oblique ridges, the outer edge with four spinules in two transverse pairs, the inner edge serrulate as usual, the spurs short, but acute at tip, the tarsus very short, the first four joints triangular. Length .10 inch; 2.5 mm.

This species and the preceding by their convex form and inflated elytra have far greater resemblance to Aegialia than to the other Psammodius. They are both truly members of the present genus as shown by the entirely concealed labrum and mandibles.

The differences between *hydropicus* and *cœlatus* are many, as will be seen in the description, the more striking are given in the synoptic table.

One specimen, Savannah, Ga.

The following species still remains unknown to us, and it is impossible to say whether it is a Psammodius or Aegialia:

Aphodius clypeatus Say.—Black; elytra testaceous; clypeus covered with small tubercles.

Inhabits Northwest Territory.

Head black, convex, covered with very small, obtuse tubercles; edge a little elevated, piceous; tips hardly truncated; thorax with irregular, small, obtuse rugæ; anterior angles rectangular; posterior edge regularly arcuated, not dilated in the middle; elytra rufotestaceous, dusky at base; with deep, punctured striæ; interstitial lines convex; thighs dull yellowish; posterior ones much dilated.

Length more than three-twentieths of an inch [4 mm.]. Readily distinguished by the rough appearance of the clypeus.

ÆGIALIA Latreille.

The mandibles and labrum are always distinctly visible beyond the clypeus. The head is nearly always verrucose, more obviously in the shorter and more ventricose species, less so in those of more elongate form.

Although the metasternum is short in the majority of the species the body is winged, generally very feebly.

The legs are stout and strongly fossorial, the anterior tibiæ especially broad and with large external teeth. The tarsi are rather short and the claws small. As the species are arranged in the fol-

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lowing table, the tarsi have greatest length in *rufescens* and gradually shorten to *spissipes*, this is also true of the terminal joint of the tarsus and the claws. In *crassa* and *spissipes* the last joint of the hind tarsus is very little longer than the fourth and the claws very small and slender.

The pygidium is usually entirely covered by the elytra, and there is no median groove such as has been remarked in Atænius.

The species are not numerous, but from present appearances our country has a greater number than all elsewhere known.

At the time of my synopsis (Trans. Am. Ent. Soc. 1871, p. 293) four species were enumerated, three have since been described by Dr. LeConte and two new ones added in the present paper, one remains unknown, although probably identical with *lacustris*.

The form of the posterior tibial spurs made the basis of the separation of species, the same plan was followed by Dr. LeConte (Proc. Am. Philos. Soc. 1878, p. 610). In the following table other characters have been used which place the species in a more natural relation and sequence, at the same time more easy to comprehend and more certain in the results obtained.

Thorax with distinct basal marginal line..... 2.
Thorax without basal marginal line..... 6.
2.—Spurs of hind tibiæ slender and usually long..... 3.
Spurs of hind tibiæ shorter, explanate at tip and with rather broad translucent border..... 5.
3.—Form slender, elongate, parallel, rufous..... **rufescens.**
Form robust, broader behind..... 4.
4.—Species of larger size .16–.22 inch; 4.–5.5 mm.
Thorax coarsely punctured, rather closely even to the lateral margin.
Elytral intervals irregularly biseriately punctulate; lateral margin of thorax coarsely crenate, the median line posteriorly distinctly impressed..... **cylindrica.**
Elytral intervals smooth; margin of thorax at most indistinctly crenate, median line not impressed..... **lacustris.**
Thorax rather finely and sparsely punctured; near the sides, especially at the hind angles quite smooth, the lateral margin entire. **Blanchardi.**
Species of small size .08 inch; 2 mm..... **pusilla.**
5.—Thorax coarsely sparsely punctured, smoother at sides, where the surface is somewhat irregular; intervals of elytra nearly flat..... **conferta.**
6.—Posterior tibiæ slender, that is much less than half as broad at apex as long on the posterior edge; elytral striæ distinctly punctured.
Thorax with coarse, sparse punctures everywhere, except a smooth space near the hind angles, a small lateral fovea only..... **latispina.**
Thorax rather closely and more finely punctured, smooth at sides, a rather large transverse fovea on the declivity..... **opifex.**

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Posterior tibiæ stout, that is fully or more than half as broad at apex as long on the posterior border.

Posterior tibiæ with oblique ridges, the discal striæ not very distinctly punctured.....**crassa.**

Posterior tibiæ without oblique ridges, but with numerous asperities; striæ very distinctly punctured.....**spissipes.**

As all the species are fimbriate along the entire border with yellowish hair, a repetition of this in each of the following descriptions has been thought unnecessary.

Æ. rufescens (*rufa* ‖ Lec.)—Elongate, parallel, feebly convex, ferruginous or reddish brown, moderately shining. Head feebly convex, coarsely punctured and scabrous, the frontal suture slightly impressed. Clypeus nearly semicircular in outline, subtruncate in front narrowly margined. Thorax a little wider than long, not narrowed at apex, sides feebly arcuate, lateral marginal subcrenate in front, serrate near the hind angles which are very obtuse, base arcuate, the marginal line distinct, disc feebly convex, with very coarse punctures rather closely placed, with finer punctures intermixed, a space near the hind angles with finer punctures only. Elytra as wide at base as the thorax, sides parallel, humeri slightly dentate, disc striate, striæ closely punctured, intervals slightly convex, smooth. Mesosternum opaque, alutaceous, obsoletely punctate. Metasternum elongate, sparsely punctate. Abdomen alutaceous, sparsely punctate. Posterior tibiæ relatively slender, with two short oblique ridges, the spurs moderately long, rather slender, acute at tip. Length .18 inch; 4.5 mm.

This species is remarkable in its elongate, parallel form, not differing greatly in this respect from *Atænius abditus*. The color is always some modification of reddish brown.

The name *rufa* proposed by LeConte is preoccupied by Fabricius, and is therefore changed to *rufescens*.

Occurs at Marquette, Lake Superior, and in western Nevada.

Æ. cylindrica Esch.—Oblong oval, slightly broader behind, convex, piceous, shining, legs brownish. Antennæ and palpi rufotestaceous. Head moderately convex, coarsely and densely punctured, rugose in front. Clypeus semicircular, subtruncate in front. Thorax nearly twice as wide as long, slightly narrower in front, anterior angles acute, sides feebly arcuate, hind angles distinct, but obtuse; base arcuate, somewhat sinuate, the marginal line distinct, the entire lateral and basal margin serrate, disc moderately convex, a slight median depression posteriorly, a concavity near the front angles, a slight depression at middle of declivity, surface very coarsely closely punctate, a little finer near the apex. Elytra as wide at base as the thorax, slightly narrower behind, humeri distinct not dentate, surface deeply striate, striæ coarsely closely punctured, intervals slightly convex, subbiseriately punctulate at middle, uniseriately at the sides. Mesosternum opaque, coarsely punctured, subcarinate between the coxæ. Metasternum rather short, smooth. Abdomen indistinctly alutaceous, each segment with a transverse row of punctures. Posterior femur not broadly oval, tibiæ relatively slender with three oblique ridges, the spurs moderately long, acute at tip. Length .16–.20 inch; 4–5 mm.

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According to Mannerheim (Bull. Mosc. 1853, iii, p. 220) this species varies in having the elytra reddish brown, or the whole surface of that color. A specimen in my cabinet from Washington Territory has the elytra reddish brown, the legs somewhat paler. The species is feebly winged, as are all our species, even the ventricose *crassa*. *Æ. sabuleti* is probably very closely related, but I have not seen any specimens of that species.

Occurs in Alaska and Washington Territory. Typical specimens from Mannerheim have been examined.

Æ. lacustris Lec.—Oblong, subcylindrical, convex, scarcely wider posteriorly, piceous, shining, legs brown. Antennæ and palpi rufotestaceous. Head moderately convex, coarsely not densely punctured, anteriorly verrucose. Clypeus semicircular, subtruncate and feebly emarginate at middle. Thorax nearly twice as wide as long, very slightly narrower in front, sides feebly arcuate, anterior angles subacute, posterior angles obtuse, but distinct; base arcuate, with distinct marginal line, the lateral margin and outer portion of base indistinctly crenulate, disc moderately convex, a flattening near the front angles, two small foveæ on the declivity, the surface coarsely, but not densely punctured, near the hind angles somewhat smoother. Elytra as wide at base as the thorax, humeri distinct, but obtuse; moderately deeply striate, striæ coarsely and closely punctured, intervals feebly convex, smooth. Mesosternum opaque, longitudinally strigose. Metasternum smooth. Abdomen moderately shining, each segment with a transverse row of punctures and others more numerous near the sides. Posterior femora moderately stout, the tibiæ relatively slender, obliquely tricarinate, the spurs rather slender and acute at tip. Length .18-.22 inch; 4.5-5.5 mm.

Varies in color in a manner similar to *cylindrica*. Closely allied to the species named, but with the margin of thorax less serrate, the median line not impressed posteriorly and the elytral intervals smooth. The two foveæ mentioned in the description are at the middle of the declivous part of the sides, placed one above the other, the upper one longer.

Occurs in the Lake Superior region also at Garland, Colorado.

Closely allied to *lacustris*, and possibly synonymous with it is a species from Alaska described by Mannerheim in the following manner:

Ægialia exarata: oblonga, modice convexa, subcylindrica, supra piceo-castanea, subtus rufescens; clypeo apice emarginato, margine rufo, crebre ruguloso; vertice subtiliter punctulato; thorace transverso, lateribus rotundato, ciliato, angulis anticis vix productis, rotundatis, disco punctis paucis majoribus irregulariter sparsis, versus latera magis congestis; elytris striis profunde exaratis, in fundo leviter crenulatis, interstitiis laevibus, humeris dente minuto acutiusculo armatis. Longit. 2.33 lin. Latit. 1 lin.

Habitat in insula Sitkha.

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Æ. Blanchardi n. sp.—Oblong, slightly broader behind, convex, piceous black, very shining, tarsi paler. Antennæ and palpi rufotestaceous. Occiput nearly entirely smooth, front and clypeus verrucose. Clypeus broadly feebly emarginate at middle, sides arcuate, a slight sinuation at the end of frontal suture, the margin narrowly reflexed. Thorax less than twice as wide as long, narrower in front, anterior angles acute, sides moderately arcuate, hind angles broadly rounded, base feebly arcuate, the marginal line entire, lateral and basal margins of thorax entire, not serrulate, disc convex, a slight flattening in the front angles, a small fovea at middle of declivity, the median line very indistinctly impressed posteriorly, surface finely sparsely punctured, smoother in front, nearly entirely smooth at sides. Elytra as wide at base as the thorax, slightly broader behind, humeri distinct, not dentate, disc convex, striæ deep, crenately not coarsely punctured, intervals nearly flat, with very minute sparse punctures. Mesosternum opaque, alutaceous and sparsely punctate, finely carinate between the coxæ. Metasternum finely scabrous. Abdomen alutaceous, each segment with a transverse row of punctures. Posterior femora not unusually stout, a row of setigerous punctures near the knee, the tibia slender, the oblique ridges interrupted forming acute tubercles, the spurs slender and acute at tip. Length .16–.18 inch; 4–4.5 mm.

This species is similar in form to *cylindrica* and *lacustris*, but is a little more robust in facies. The punctures of the thorax are actually finer than in any other species in our fauna. From either of the two preceding species it may be known by the fine punctuation and by the sides of the thorax nearly smooth.

Occasionally varieties occur with the suture and lateral margin of the elytra near the apex reddish brown.

I take great pleasure is testifying my appreciation of his services to science and his many kind favors to me, by naming the species in compliment to Mr. Fred. Blanchard, of Lowell, Mass.

Collected at Lowell, Mass.; others in my cabinet are marked North Carolina.

Æ. pusilla n. sp.—Oblong oval, slightly broader behind, convex, piceous, legs, metasternum and inflexed sides of pronotum rufotestaceous. Antennæ pale, club darker. Clypeus subtruncate, the margin very narrowly reflexed. Front sparsely punctate and alutaceous. Thorax about one-fourth wider than long, base and apex equal, sides (seen above) feebly arcuate, margin not serrulate, anterior angles subacute, hind angles broadly rounded, basal marginal line distinct, disc convex, sparsely, but very regularly punctate, a smooth median line. Elytra not wider at base than the thorax, humeri very distinct, sides feebly arcuate, disc deeply striate, striæ rather coarsely punctured, intervals convex with a single series of punctures, those of the sutural interval closely placed. Mesosternum rather smooth posteriorly, alutaceous in front. Metasternum smooth, with very fine punctures near the sides. Abdomen obsoletely coarsely punctate at the sides, last segment paler and more shining, the others opaque. Posterior femora not very stout, with scattered punctures, the posterior tibiæ slender, without oblique ridges, the spurs slender. Length .08 inch; 2 mm.

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The punctures of the intervals near the sides and apex bear very short yellowish hairs, and it is probable that those of the disc are similarly provided in recent specimens. This species resembles *Psammodius nanus* in form, but is even more robust and convex. It is even smaller than any of the specimens of that species seen by me from our fauna, and is therefore the smallest Scarabæide known to me.

Occurs in Washington Territory; one specimen kindly given me by Mr. L. E. Ricksecker.

Æ. conferta Horn.—Oblong, slightly broader behind, convex, piceous black, elytra sometimes reddish brown. Antennæ rufotestaceous. Head coarsely and rather closely verrucose. ypeus subtruncate and very feebly emarginate at middle, on each side arcuate, the margin narrowly reflexed. Thorax twice as wide as long, narrower in front, anterior angles not acute in front, sides moderately arcuate, hind angles very obtuse, base arcuate, marginal line distinct, lateral and basal margins not crenate, disc convex, a slight depression at the front angles, a fovea at middle of declivity, median line very vaguely impressed posteriorly, surface sparsely irregularly punctate, a smooth space at the hind angles. Elytra as wide at base as the thorax, slightly broader behind, humeri obtuse, the striæ moderately deep, the punctures moderately fine and not crenate, intervals flat, smooth. Mesosternum opaque, punctate, not carinate between the coxæ. Metasternum slightly rugose at sides. Abdomen with few, coarse, irregularly placed punctures. Posterior femora oval, a row of setigerous punctures near the knee, the tibiæ stout, the outer edge muricate and with two indistinct oblique ridges, the spurs short, broadly expanded, obtuse at tip, the margins translucent. Length .14–.18 inch; 3.5–4.5 mm.

This species varies in the manner indicated for *cylindrica*. The posterior tibiæ are much stouter than the species which precede, but less so than *crassa*, the apex being less in length than half the length of the outer side of the tibia. The sculpture of thorax approaches more nearly to *Blanchardi*, but the form of the hind tibia and its spurs will readily distinguish it from this.

Seems to be more widely diffused than any of the other species. Specimens in my cabinet are from Illinois and Washington Territory; others in the LeConte cabinet from Georgia.

Æ. latispina Lec.—Oblong oval, moderately robust, a little broader behind, piceous, shining, legs brownish. Antennæ and palpi pale. Head coarsely and closely verrucose. Clypeus subtruncate, the margin narrowly reflexed, the sides arcuate with a slight notch at end of frontal suture, genæ more distinct than usual. Thorax nearly twice as wide as long, narrower in front, the front angles not prominent anteriorly, sides arcuate, the margin not crenate, hind angles obtusely rounded, the base arcuate, without basal marginal line, disc convex, a slight depression at front angles, a fovea at middle of declivity, disc coarsely rather sparsely punctured, a smooth space at hind angles. Elytra as wide at base

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as thorax, slightly broader behind, humeri distinct, but obtuse; surface, the striæ deep, punctures moderately coarse and close, but not deeply impressed, intervals flat, smooth. Mesosternum opaque, punctate, not carinate between the coxæ. Metasternum smooth. Abdomen very indistinctly punctate. Posterior femora stout, with a row of coarse setigerous punctures near the knee, the tibiæ moderately stout, with two feeble oblique ridges, the spurs slender at base, dilated at apex with translucent borders. Length .16 inch; 4 mm.

This species has very much the facies of the larger species which precede, but differs especially in the absence of the basal marginal line of the thorax and the stouter tibiæ and spurs. The genæ are more distinctly prominent than in any other species of the genus. It is a larger species than *opifex*, and with a more coarsely and less closely punctured thorax.

Occurs in southern California. LeConte says in Mojave Desert, but as the specimens were collected by Morrison this is unlikely.

Æ. opifex n. sp.—Oblong oval, broader behind, convex, piceous black, shining, legs brownish. Antennæ rufotestaceous. Head rather closely verrucose. Clypeus subtruncate and feebly emarginate, the sides arcuate, margin narrowly reflexed. Thorax twice as wide as long, narrower in front, anterior angles not prominent anteriorly, sides moderately arcuate, the margin not crenate, hind angles very obtuse, base arcuate, slightly sinuate each side of middle, the marginal line absent, disc convex, a slight depression at front angles, a transverse fovea at the middle of declivity, surface moderately closely and relatively coarsely punctate, smoother along the base and apex, a large smooth space at hind angles. Elytra as wide at base as the thorax, broader behind, humeri obtuse, striæ deep, coarsely moderately closely punctate, intervals slightly convex, smooth. Mesosternum opaque, sparsely punctate, not carinate between the coxæ. Metasternum slightly scabrous at sides. Abdomen irregularly coarsely punctate. Posterior femora moderately stout, a row of setigerous punctures near the knee, the tibia rather slender, the oblique ridges formed of acute tubercles, the space between quite smooth, the spurs slender at base, broadly dilated externally, the edges translucent. Length .14 inch; 3.5 mm.

At present this is the smallest species known in our fauna. It is a little more ventricose than the preceding species. The posterior tibiæ are not more stout than in *Blanchardi*, and are called "rather slender" in the above description in comparison with *crassa* and *spissipes*. The only species from which there might be any difficulty in separating the present is *latispina*, but the smaller size and thoracic sculpture will be at once evident.

Collected abundantly at Lowell, Mass., by Mr. Fred. Blanchard.

Æ. crassa Lec.—Ovate, rather ventricose and convex, piceous black, shining. Antennæ pale. Head closely verrucose. Clypeus subtruncate, the margin very narrowly reflexed. Thorax nearly twice as wide as long, narrower in front, sides feebly arcuate, anterior angles not prominent, lateral margin not serrate, hind

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angles obtusely rectangular, base feebly arcuate, the marginal line wanting, disc convex, a postapical transverse impression at front angles, a small fovea at middle of declivity, surface coarsely not closely punctate, the sides absolutely smooth. Elytra as broad at base as the thorax, broader behind, humeri distinct, but obtuse, striæ not deep, the punctures rather small and not close, intervals flat, smooth. Mesosternum opaque, finely alutaceous, not carinate between the coxæ. Metasternum slightly rugose at sides. Abdomen indistinctly punctate. Posterior femora stout with coarse, setigerous punctures near the knee, the tibiæ very stout, the outer face with three oblique ridges, the upper two composed of tubercles, the lower prominent, spurs rather slender, but explanate toward end and translucent at sides. Length .14-.20 inch; 3.5-5 mm.

While the usual color is piceous black, specimens occur with the elytra brownish or even quite red. The hind tibiæ are very broad, although rather flat, the apex is fully half the length of the shorter edge. The punctuation of the elytral striæ seems variable, and in many specimens the punctures are quite indistinct. This species will be recognized as the most ventricose and massive among those in our fauna.

Occurs abundantly on the sea-coast of California south of San Francisco.

Æ. spissipes Lec.—Oblong, subcylindrical, rufotestaceous, moderately shining. Antennæ pale. Head convex, rather coarsely granulate and rugose. Clypeus with narrow reflexed border, subtruncate in front, sides arcuate, a slight notch at the suture, genæ not more prominent than the eyes. Thorax not quite twice as wide as long, sides feebly arcuate, apex and base equal, hind angles rounded, base arcuate, without distinct marginal line, disc moderately convex, indistinctly rugoso-punctate. Elytra as wide at base as the thorax, humeri distinct, but obtuse, surface deeply striate, striæ indistinctly punctate, intervals flat, the surface somewhat irregular. Mesosternum alutaceous. Metasternum at sides alutaceous, shining, a few scattered fine punctures. Abdomen coarsely deeply and sparsely punctured. Anterior tibiæ with two large teeth and a much smaller one, above not crenate. Posterior femora oval, sparsely punctate, the tibia stout, as broad at apex as half the length, the outer side without transverse carinæ, but with acute granules arranged in longitudinal series, the tibial spurs short, stout and somewhat expanded at tip. Length .16-.18 inch; 4-4.5 mm.

Of this species three specimens have been seen, the type from Marquette, Mich., agrees entirely with the above description, two others from Lowell, Mass., are more slender, the clypeus more obviously truncate and the abdomen with fewer punctures. These characters are possibly merely variations or sexual, but more specimens must be studied before this can be determined.

Marquette, Mich. (Schwarz), Lowell, Mass. (Blanchard).

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Group **G.**

A. nevadensis Horn, loc. cit. p. 121.
A. gentilis n. sp.
A. cribratus Lec., U. S. Geol. Surv. loc. cit. p. 455.

Group **H.**

A. opacus Lec., Col. Hefte x, 1872, p. 193.
A. lutulentus Hald., Proc. Acad. 1842, p. 304; Jour. Acad. 1848, p. 104; Horn, loc. cit. p. 124; Harold, Berl. Zeitsch. 1873, p. 196.
corvinus Hald., ♂, Jour. Acad. 1848, p. 104.
A. stupidus Horn, loc. cit. p. 125; Harold, loc. cit. p. 204.
A. lentus Horn, loc. cit. p. 125.
A. decipiens n. sp.

Group **I.**

A. explanatus Lec., U. S. Geol. Surv. loc. cit. p. 457.
A. rudis Lec., U. S. Geol. Surv. loc. cit. p. 458.
A. phæopterus Lec., U. S. Geol. Surv. loc. cit. p. 456.
A. brevicollis Lec., U. S. Geol. Surv. loc. cit. p. 455.
A. marginatus Lec., U. S. Geol. Surv. loc. cit. p. 456.
A. ochreipennis Horn, Trans. Am. Ent. Soc. 1871, p. 295.
A. Haldemani (*politus* ‖) Horn, Trans. Am. Ent. Soc. 1870, p. 128.
A. rubeolus Beauv., Ins. Af. et Amer. p. 90, pl. 2, fig. 4; Horn, loc. cit. p. 126.
copronymus Mels., Proc. Acad. 1844, p. 136.
A. stercorosus Mels., Proc. Acad. 1844, p. 136; Horn, loc. cit. p. 127.
A. concavus Say, Jour. Acad. 1823, p. 214; Horn, loc. cit. p. 128.
lævigatus Hald., Jour. Acad. 1848, p. 103.

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A. **rubidus** Lec., Pacif. R. R. Rep. 47 par., App. 1, p. 41.
A. **militaris** Lec., Proc. Acad. 1858, p. 65; Horn, loc. cit. p. 127.
A. **æmulus** n. sp.
A. **rubiginosus** Horn, loc. cit. p. 127.
A. **consentaneus** Lec., Agass. Lake Superior, p. 255; Horn, loc. cit. p. 128.
A. **luteolus** n. sp.
A. **phalerioides** Horn, loc. cit. p. 131.
A. **Larreæ** n. sp.
A. **parcus** n. sp.
A. **ægrotus** Horn, loc. cit. p. 127.
A. **dentiger** Lec., Proc. Acad. 1858, p. 65; Horn, loc. cit. p. 130.
A. **coloradensis** Horn, loc. cit. p. 130.
A. **bicolor** Say, Jour. Acad. 1823, p. 212: Horn, loc. cit. p. 130.
A. **luxatus** n. sp.
A. **serval** Say, Bost. Jour. 1837, p. 167; Horn, loc. cit. p. 122.
Steinheili Harold, Col. Hefte v, p. 100.
A. **inquinatus** Herbst, Füssl. Arch. 1784, v, 2, p. 6, pl. 19, fig. 5; Erichs., Ins. Deutsch. iii, p. 839.
maculipennis Mels., Proc. Acad. 1844, p. 137.
A. **pardalis** Lec., Pacif. R. R. Rep. 47 par., App. i, 41; Horn, loc. cit. p. 123.
A. **leopardus** Horn, loc. cit. p. 124.
A. **inutilis** n. sp.
A. **pumilus** n. sp.
A. **terminalis** Say, Jour. Acad. 1823, p. 213; Horn, loc. cit. p. 129.
A. **cruentatus** Lec., U. S. Geol. Surv. loc. cit. p. 456.
A. **rufipes** Linn., Faun. Suec. p. 139; Erichs., Ins. Deutsch. iii, p. 892.
A. **depressus** Kug., Schneid. Mag. iii, p. 262; Erichs., loc. cit. p. 896; Harold, Ann. Fr. 1862, p. 301.

Group **K.**

A. **scabriceps** Lec., U. S. Geol. Surv. loc. cit. p. 457.
A. **nanus** n. sp.
A. **acerbus** n. sp.

Group **L.**

A. **rubripennis** Horn, Trans. Am. Ent. Soc. 1870, p. 132.
A. **subtruncatus** Lec., U. S. Geol. Surv. loc. cit. p. 457.
A. **Walshii** Horn, loc. cit. p. 132.
A. **femoralis** Say, Jour. Acad. 1823, p. 215; Horn, loc. cit. p. 131.
A. **prodromus** Brahm, Ins. Kal. 1790, i, p. 3; Erichs., loc. cit. p. 871.
A. **tenuistriatus** n. sp.

Group **M.**

A. **oblongus** Say, Jour. Acad. 1823, p. 215; Horn, loc. cit. p. 132.
badipes Mels., Proc. Acad. 1844, p. 135.
A. **sparsus** Lec., U. S. Geol. Surv. loc. cit. p. 458.
A. **ovipennis** Horn, Trans. Am. Ent. Soc. 1870, p. 133.
A. **humeralis** Lec., U. S. Geol. Surv. loc. cit. p. 458.

———o———

A. **cadaverinus** Mann., Bull. Mosc. 1843, ii, p. 261 (unknown to me).

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OXYOMUS Cast.

O. porcatus Fab., Syst. Ent. p. 20; Erichs., Ins. Deutsch. iii, p. 906; Duval, Gen. Col. Eur. iii, pl. 7, fig. 33.

opacifrons Horn, Trans. Am. Ent. Soc. 1871, p. 284.

DIALYTES Harold.

D. truncatus Mels. (*Aphodius*), Proc. Acad. ii, p. 135; Horn, Trans. Am. Ent. Soc. 1870, p. 133.

corvinus Hald., Jour. Acad. 1848, p. 104.

D. Ulkei Horn, Trans. Am. Ent. Soc. 1875, p. 141.

D. striatulus Say (*Trox*), Jour. Acad. v, p. 172; edit. Lec. ii, p. 295; Horn, Trans. Am. Ent. Soc. 1870, p. 134.

cribrosus Lec., Agass. Lake Superior, p. 225.

ATÆNIUS Harold.

A. insculptus n. sp.

sculptilis ‡ Lec., Proc. Am. Philos. Soc. 1878, p. 402.

A. cylindrus Horn, Trans. Am. Ent. Soc. 1871, p. 289.

Hornii Harold, Col. Hefte xii, 1874, p. 19.

A. Lecontei Harold, Col. Hefte xii, 1874, p. 20.

A. lucanus Horn, Trans. Am. Ent. Soc. 1871, p. 288.

A. abditus Hald. (*Aphodius*), Jour. Acad. 1848, p. 106; Horn, Trans. Am. Ent. Soc. 1871, p. 289.

attenuator Harold, Col. Hefte xii, 1874, p. 22.

A. texanus Harold, Col. Hefte xii, 1874, p. 23.

A. desertus Horn, Trans. Am. Ent. Soc. 1871, p. 289.

A. inops n. sp.

A. læviventris n. sp.

A. imbricatus Mels. (*Aphodius*), Proc. Acad. 1844, p. 136; Horn, Trans. Am. Ent. Soc. 1871, p. 285.

sordidus Harold, Col. Hefte v, p. 103.

A. alternatus Mels. (*Oxyomus*), Proc. Acad. 1844, p. 147; Horn, Trans. Am. Ent. Soc. 1871, p. 285.

A. socialis Horn, Trans. Am. Ent. Soc. 1871, p. 287.

socialis Harold, Berl. Zeitschr. 1874, p. 174.

A. puncticollis Lec., Proc. Acad. 1868, p. 66.

A. Wenzelii n. sp.

A. ovatulus Horn, Trans. Am. Ent. Soc. 1871, p. 286.

A. gracilis Mels. (*Oxyomus*), Proc. Acad. 1844, p. 137; Harold, Berl. Zeitschr. 1867, p. 281; Horn, Trans. Am. Ent. Soc. 1871, p. 286.

A. figurator Harold, Ent. Hefte xii, 1874, p. 24.

A. robustus Horn, Trans. Am. Ent. Soc. 1871, p. 285.

A. oblongus Horn, Trans. Am. Ent. Soc. 1871, p. 286.

A. inquisitus n. sp.

A. strigatus Say (*Aphodius*), Jour. Acad. iii, 1823, p. 212; Say's Works, ed. Lec. ii, p. 137.

spretulus Hald., Jour. Acad. 1848, p. 106.

A. stercorator Fab. (*Aphodius*), Spec. Ins. i, p. 22; Oliv. Ent. 1, 3, p. 89, pl. 17, fig. 155 (synonymy omitted).

A. cognatus Lec. (*Euparia*), Proc. Acad. 1858, p. 65.

A. californicus n. sp.

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A. lobatus Horn, Trans. Am. Ent. Soc. 1871, p. 287.
A. hirsutus Horn, Trans. Am. Ent. Soc. 1871, p. 288.

EUPARIA Serv.

E. castanea Serv., Enc. Méth. Ins. p. 357; Westw., Trans. Ent. Soc. Lond. iv, p. 239, pl. 17, fig. 3; Horn, Trans. Am. Ent. Soc. 1871, p. 289.

RHYSSEMUS Muls.

Rh. scaber Hald., Jour. Acad. 1848, p. 107; Horn, Trans. Am. Ent. Soc. 1871, p. 290.
Rh. californicus Horn, Trans. Am. Ent. Soc. 1871, p. 290.
Rh. sonatus Lec., Trans. Kans. Acad. Sc. x, 1881, p. 77.
Rh. riparius Horn, Trans. Am. Ent. Soc. 1871, p. 290.
cælatus Lec., Trans. Kans. Acad. Sc. x, 1881, p. 77.

PLEUROPHORUS Muls.

P. cæsus Panz., Faun. Germ. 35, 2; Erich., Ins. Deutsch. iii, p. 913; Horn, Trans. Am. Ent. Soc. 1871, p. 291.
P. ventralis n. sp.

PSAMMODIUS Serv.

Ps. bidens Horn, Trans. Am. Ent. Soc. 1871, p. 293.
Ps. ægialioides Hald., Jour. Acad. 1848, p. 107; Horn, Trans. Am. Ent. Soc. 1871, p. 292.
Ps. quinqueplicatus Horn, Trans. Am. Ent. Soc. 1871, p. 292.
Ps. interruptus Say, Bost. Jour. 1. p. 178; edit. Lec. ii, p. 651; Horn, Trans. Am. Ent. Soc. 1871, p. 292.
Ps. nanus DeGeer (*Scarabæus*), Mem. Ins. iv, p. 318; Harold, Stett. Zeit. 1867, p. 282.
parvulus Chev., Ann. Fr. 1864, p. 415.
Ps. cælatus Lec. (*Aegialia*), Pacif. R. R. Rep. 1857, App. i, p. 42; Horn, Trans. Am. Ent. Soc. 1871, p. 292.
Ps. hydropicus n. sp.
Ps. ? clypeatus Say (*Aphodius*), Long's Second Exped. p. 228; edit. Lec. i, p. 183 (unknown to me).

ÆGIALIA Latr.

Æ. rufescens Horn, ante.
rufa ‖ Lec., Proc. Amer. Philos. Soc. 1878, p. 610.
Æ. cylindrica Esch. (*Psammodius*), Entomogr. i, p. 11; Mann. (*Oxyomus*), Bull. Mosc. 1843, ii, p. 262; idem. 1853, iii, p. 220; Horn, Trans. 1871, p. 293.
Æ. lacustris Lec., Agass. Lake Superior, 1850, p. 225; Horn, Trans. Am. Ent. Soc. 1871, p. 293.
? *exarata* Mann., Bull. Mosc. 1853, iii, p. 219.
Æ. Blanchardi n. sp.
Æ. pusilla n. sp.
Æ. conferta Horn, Trans. Am. Ent. Soc. 1871, p. 294.
Æ. latispina Lec., Proc. Amer. Philos. Soc. 1878, p. 611.
Æ. opifex n. sp.
Æ. crassa Lec., Pacif. R. R. Rep. 1857, App. 1, p. 42; Horn, Trans. Am. Ent. Soc. 1871, p. 294.
Æ. spissipes Lec., Proc. Amer. Philos. Soc. 1878, p. 611.

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Notes upon a small collection of RHOPALOCERA made by Rev. B. C. Henry in the Island of Hainan, together with descriptions of some apparently new species.

BY REV. W. J. HOLLAND, M.A., PH.D.
OAKLAND, PITTSBURGH, PA.

I am indebted to my esteemed friend, Rev. B. C. Henry, for the privilege of adding to my collection a number of specimens of the lepidopterous insects of Hainan collected by him upon the occasion of a visit to the island in January of the past year. Between fifteen and twenty years ago the late Robert Swinhoe visited Hainan and made extensive collections, principally of the birds and mammals, devoting but little attention to its insect fauna. Aside from a paper by Mr. F. Moore in the "Proceedings of the Zoological Society of London" for 1878, giving a list of the lepidoptera collected by Mr. Swinhoe and a few incidental references to specimens taken by Swinhoe and contained in the collection of Mr. Moore, I have failed to discover anything bearing directly upon the entomology of the country. The island is still to a great extent *terra incognita* to the entomologist. The list of the species taken by Mr. Henry, which follows, reveals, as might be expected, that the fauna of Hainan is closely allied to that of the adjacent mainland. Unfortunately Mr. Henry's efforts to gain a knowledge of the lepidoptera of this interesting region were interrupted by a violent attack of illness, and the accidental loss of part of his collecting material.

Family **NYMPHALIDÆ** Swainson.

Subfamily DANAINÆ, Bates.

Genus **DANAIS** Latr.

1. **Danais Aglea** Cram., Pap. Exot. iv, t. 377, E.; Marshall and DeNicéville, Butt. India, Burmah and Ceylon, vol. i, p. 38, PL. VI, FIG. 7.

Several specimens, ♂ and ♀.

2. **Danais Gautama** Moore, Ann. and Mag Nat. Hist. series iv, vol. xx, p. 43 (1877).

One poor ♀.

3. **Danais Limniace** Cram., Pap. Exot. I, t. 59. D. E.; M. and DeN. Butt. India, B. and Ceylon, vol. i, p. 47.

Several specimens ♂ and ♀.

4. **Danais Genutia** Cram., Pap. Exot. III, t. 206. C. D.; Distant, Rhop. Malay, p. 18, tab. ii, FIGS. 2 and 3. M. and DeN. l. c. p. 52 (*Danais Plexippus* auctorum, *nec.* Linnæus).

Numerous specimens.

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NOTE.—I follow recent writers in restoring the name given by Cramer to this species. The name *Plexippus* is properly applied to the North American species commonly known as *Archippus*. This latter name was applied by Fabricius to the North American species in 1793, whereas Linnaeus had already described and named it *Plexippus* as far back as 1764.

Genus **SALPINX** Hübn.

5. **Salpinx Negleyana** n. sp. PL. I, FIG. 2.

♂. UPPER SURFACE.—*Fore wings* deep black, reflecting brilliant blue, crossed upon the outer half by three rows or bands of spots. The inner band is greatly curved and consists of five purple spots, often pupilled with white. The uppermost of these spots is small and circular, situated on the costal margin a little beyond the middle, the remaining four are oblong, and are grouped in pairs, the first pair at the end of the cell, one spot on either side of the first discoidal nervule, and the lower pair below the cell; one spot on either side of the second median nervule not far from its origin; a submarginal row of from seven to eight oblong white spots shaded inwardly with blue extends across the wing parallel to the external margin; and is in turn followed by a marginal row of minute white or bluish white spots disposed in pairs, a pair on each intra-neural space. These marginal spots are in some specimens more or less obsolete. *Hind wings* deep brown at base and upon the discoidal area, widely testaceous upon anterior margin and broadly fuscous on exterior and posterior margins. A broad oval spot of luteous covers the upper half of the cell near its extremity and the anterior margin of the wing; in addition there is a submarginal row of obscure white spots, of which the three nearest the external angle are the most conspicuous, and a marginal row of small white spots sometimes very distinct, sometimes altogether obsolete.

UNDER SURFACE.—The under surface is uniformly dark fuscous, except on the basal half of the posterior margin of the primaries, which is grayish luteous. The spots are as on the upper surface, but uniformly grayish white, more clearly defined and smaller than on the upper side save the spot above the sexual mark, which is large and broad. A number of minute white spots appear at base of both wings. Head, patagia and under side of thorax spotted with white.

♀.—The female does not differ from the male except in the form of the wings characteristic of the genus, and in the absence of the sexual mark of the primaries and of the luteous marks of the upper

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and lower surfaces. One female has a sagittate blue spot upon the upper surface of primaries at the end of the cell. Expanse ♂ 3¼ inches; ♀ 3¼–3½ inches.

Described from numerous specimens in my collection. I take pleasure in naming this species at the suggestion of Mr. Henry, in honor of our mutual friend, Hon. Wm. B. Negley, of Pittsburgh, Pa.

Genus **CALLIPLŒA** Butl.

6. **Calliplœa Ledereri** Feld., n. var. HAINANA *mihi.*

I have received quite a series of male and female specimens of what appears to me to be a local race of *Ledereri*, to which I attach the varietal name *Hainana.* The specimens differ from typical *Ledereri* as depicted in the Novara Reise, and in Distant's Rhopalocera Malayana in that the submarginal row consists of seven spots instead of six, and that these spots are distinctly pupilled with white. The chestnut-brown or fulvous tint characteristic of the posterior margin of the fore wings and of the hind wings of Malaccan examples of *C. Ledereri* is also wanting, most examples having this shade replaced by fuscous. The underside of specimens differs in no respect from specimens of *Ledereri* received by me from the Malay Peninsula.

Genus **EUPLŒA** Fabr.

7. **Euplœa Felderi** Butl., Proc. Zool. Soc. Lond. 1866, p. 275.

Two male specimens.

Subfamily SATYRINÆ, Bates.

Genus **EUPLŒAMIMA** n. genus.

8. **Euplœamima Diademoides** Moore, n. var. HENRICI, *mihi* PL. I, FIG. 1, *Zethera diademoides* Moore, Proc. Zool. Soc. Lond. 1878, p. 824, PL. 51, FIG. 3; Marshall and DeN. vol. i, p. 98, PL. XIV, FIG. 33.

The specimens before me differ from the typical form in that the submarginal band on the primaries has seven instead of six white spots, and that there is a band of four white spots crossing the apex of the primaries transversely between this submarginal band and the cell.

I do not believe that this insect is correctly referred to the genus *Zethera* Felder. The neuration and the convex margin of the primaries indicate to me its generic difference from *Zethera.* Before having seen Mr. Moore's description and the second part of vol. i of Marshall and DeNiceville, I made up my mind that the insect is generically distinct from all others, and accordingly submitted a drawing of it under the MS. name of *Euplœamima Henrici* to Mr.

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W. L. Distant, who agreed with me at the time in my judgment as to its generic position. Being of the same way of thinking still, I propose the name *Euplœamima* for a genus of which this insect shall be the type.*

Genus **LETHE** Hübn.

9. **Lethe Europa** Fabr., Syst. Ent. p. 500, No. 247; Distant, Rhopal. Malayana, p. 43, Pl. V, figs. 5 and 6.

This well known species seems to be exceedingly abundant in Hainan. Numerous specimens, mostly in a worn condition, ♂ ♂ and ♀ ♀.

10. **Lethe Dyrta** Feld., Novara Reise, Lep. III, p. 498, n. 862, t. 68, fig. 4-5. (1867.)

A local variety, having the anterior wings somewhat strongly produced at the apex.

Genus **NEOPE** Butl.

Blanaida Kirby.

11. **Neope Muirheadii** Feld., Wien. Ent. Mon. vi, p. 28.

I have a good series of the males and females of this species, revealing the fact that there is considerable variation in the number and distinctness of the ocelli upon the upper surface of the wings. One female agrees with Felder's description in having three ocelli on the upper surface of the anteriors and two white costal spots. Most of the females have four well marked ocelli on the upper surface of the anteriors. One female has six ocelli on the under surface of the left anterior wing, two of them minute; and four on the right anterior wing. The same female has six ocelli visible on the upper surface of the posteriors. Most of the females and all the males in my possession display only four ocelli on the upper surface of the posteriors. The normal number of ocelli on the lower side of the posteriors is eight.

The species appears to be common in Hainan.

Genus **MELANITIS** Fabr.

12. **Melanitis Ismene** Cram. Moore, Lep. Ceylon i, p. 14, PL. X, FIG. 2, a-b. Distant, Rhop. Malay. p. 42, PL. IV, FIGS. 9, 11 and 12.

The collection contains several typical specimens and one of the pale ochraceous variety figured by Distant Pl. IV, fig. 11. The specimens are all in very poor condition, being flown and rubbed, indicating that in January the brood in Hainan had already nearly passed away.

* Since the above was put into type I find that Herr Georg Semper in his "*Schmetterlinge der Philippinischen Inseln*," p. 36, suggests the reference of *Zethesa diademoides* Moore, to the genus *Anadebis* Butl.

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Genus **MYCALESIS** Hübn.

Subgenus *Gareris* Moore.

13. **Gareris Francisca** Cram. (*Pap. Francisca*) Pap. Exot. IV, PL. 326, FIG. E. F. (1780.)

Numerous examples of both male and female.

Subgenus *Orsotriæna* Moore.

14. **Orsotriæna Runeka** Moore, Cat. Lep. Mus. E. I. C. i, p, 234.

Several specimens, male and female. Very variable on the underside. In one melanic female the yellowish white line which runs across the primaries and secondaries is obsolete, and the ocelli are very indistinct.

Subgenus *Calysisme* Moore.

15. **Calysisme Mineus** L. Syst. Nat. I. ii, p. 768.

One female of this variable and widely distributed species is larger and lighter in color than any I have received from other parts of the East, but in all other respects agrees with the form accepted as typical.

16. **Calysisme Perseus** Fabr., Ent. Syst. p. 488. Moore, Trans. Ent. Soc. London, 1880, p. 163.

Several specimens ♂ and ♀.

Subgenus *Sadarga* Moore.

17. **Sadarga Charaka** Moore, Proc. Zool. Soc. Lond. 1874, p. 566.

A pair *in coitu.*

Genus **YPHTHIMA** Hübn.

18. **Yphthima Zodia** Butl., Trans. Ent. Soc. Lond. 1871, p. 402.

Several males and females.

The female of this species differs from the male in having but one subanal ocellus on the hind wing. The dark central band upon the under side of the hind wings, which the author of the species regards as differentiating it from all others, is not found in the female, at least not in the two examples of ♀ received by me. These females were found in the envelopes *in coitu* with males which answered perfectly to Mr. Butler's description of *Y. Zodia.*

19. **Yphthima micrommatus** n. sp., Pl. II, fig. 3.

MALE.—UPPERSIDE cinereous gray. *Anterior wing* with a very small black subapical ocellus, pupilled with blue and surrounded by a narrow circle of pale ochraceous. *Posterior wings* with two subanal ocelli like that of the anterior wing. UNDERSIDE paler than the upper, with the subapical spot of the *primaries* much larger than on the upper surface. This spot is oval in form, with two blue spots on the black ground and a broad ring of yellow surrounding it.

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Two bands of brown cross the anterior wing. *Posteriors* with six exceeding small ocelli, four near the anal angle, two near external angle.

FEMALE.—Like the male, except that there is but one small ocellus upon upper surface of the secondaries. Expanse 1⅝ inch.

Two ♂ ♂, one ♀. Types in Coll. Holland.

Subfamily ELYMNINÆ, H. S.

Genus **ELYMNIAS** Hübn.

20. **Elymnias Hainana** Moore, Proc. Zool. Soc. Lond. 1878, p. 696.

Two examples, both males.

A local form of *E. Undularis*, Drury.

Subfamily NYMPHALINÆ, Bates.

Genus **CETHOSIA** Fabr.

21. **Cethosia Biblis** Drury, Ill. Exot. Ent. I. t. 4, fig. 2 (1773); Cramer Pap. Exot. II. t. 175, A, B. (1779.)

Numerous examples, ♂ and ♀. Dried specimens of this species gives forth, when relaxed, a strong odor like that of specimens of *Heliconia*, and like these and the various species of *Danais* seems to be exempt from attack by mites.

Genus **CYNTHIA** Fabr.

22. **Cynthia Deione** Erichs., var HAINANA, n. var.

The single specimen of *C. Deione* received by me from Hainan is remarkable for its small size, having only two-thirds of the alar expanse of specimens received from Java and elsewhere. It is also very faintly and obscurely marked upon the upper and lower surfaces, the dark lines and spots found in typical *Deione* being almost obsolete on the upper surface and very indistinct on the lower. The difference is so great that I am almost tempted to regard the insect as a distinct species. It is certainly worthy of a varietal name.

Genus **CUPHA** Billberg.

Messaras, Doubl.

23. **Cupha Erymanthis** Drury, Ill. Exot. Ent. I, t 15, figs. 3 and 4. (1773.)

One poor specimen, ♀.

Genus **ATELLA** Doubl.

24. **Atella Phalanta** Drury (*Pap. P.*), Ill. Exot. Ent. t. 21, fig. 12. (1773.)

Several specimens altogether like examples received from Madagascar and Malacca.

Genus **VANESSA** Fabr.

25. **Vanessa Charonia** Drury (*Pap. C.*), Ill. Exot. Ent. I, t. 15, figs. 1 and 2. (1773.)

One rubbed specimen, ♂.

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Genus **PYRAMEIS** Hübn.

26. **Pyrameis Cardui** Linn.

The primal decree on account of sin was, that the earth should bear "thorns and thistles," and so wherever there is earth there are thistles, and wherever there are thistles there is the "thistle butterfly."

Genus **JUNONIA** Hübn.

27. **Junonia Lemonias** L., Syst. Nat. ed. x, p. 473, No. 93 (1758); Mus. Ulr. p. 277 (1764); Marshall and DeN. Vol. II, p. 70. (1886.)

Numerous examples.

28. **Junonia Atlites** L., Cent. Ins. p. 24, n. 72 (Amoen. VI, p. 407.) (1763); Distant, Rhop. Malay. p. 93, Pl. XI, figs. 11 and 12; Marshall and DeN., Vol. II, p. 69. (*J. Laomedia auctorum.*)

Apparently common in Hainan.

29. **Junonia Hierta** Fabr. (*Pap. H.*), Ent. Syst. Suppl. p. 424; *J. Œnone* Cram., Pap. Exot. Vol. I, Pl. XXXV, figs. A, B, C; *J. Hierta* Marshall and DeN., Vol. II, p. 71.

Several specimens.

30. **Junonia Asterie** L., Syst. Nat. Ed. x, p. 472, n. 90 (1758); Distant, Rhop. Malay. p. 94, Pl. XI, figs. 1 and 2; Marshall and DeN., Vol. II, p. 67.

Five examples.

31. **Junonia Almana** L. (*Pap. A.*), l. c. p. 472, n. 89; Marshall and DeN., Vol. II, p. 68.

Six or seven examples.

32. **Junonia Orithya** L. (*Pap. O.*), l. c. p. 473, n. 94; Marshall and DeN., Vol. II, p. 73.

A few examples.

Genus **PRECIS** Hübn.

33. **Precis Iphita** Cram. (*Pap. I.*), Pap. Exot. III, Pl. 209, figs. C, D. (1782.)

Three male specimens.

Genus **ERGOLIS** Boisd.

34. **Ergolis Alternus** Moore, Proc. Ent. Soc. Lond. 1878, p. 698.

This is only a dark, local variety of *E. Ariadne*, L.

Thirty specimens, ♂ and ♀.

Genus **CYRESTIS** Boisd.

35. **Cyrestis Cocles** Fabr., Mant. Ins. Vol. II, p. 7, n. 53; Donovan, Ins. India, Pl. XXIII, fig. 2; Distant, Rhop. Malay. Appendix, p. 442, Pl. XLI, fig. 13; Marshall and DeN., Vol. II, p. 254, Pl. XXIII, fig. 107.

Several specimens.

The figure of Donovan only remotely suggests this species. It is very poor, even for Donovan.

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Genus **NEPTIS** Fabr.

36. **Neptis Hordonia** Stoll, Suppl. Cram. Pl. 33, figs. 4 and 4D (1770); *N. Plagiosa* Moore, Proc. Ent. Soc. London, 1878, p. 830; *N. Rihodona* Moore, Proc. Zool. Soc. London, 1878, p. 697.

Several specimens, male and female.

I am convinced, after a careful study of the whole matter aided by long suites of specimens from various Eastern localities, that *N. Plagiosa* Moore, and *N. Rihodona* Moore, are but varietal forms of *Hordonia* Stoll. The Hainan specimens before me answer partly to the description of *Rihodona*, partly to that of *Plagiosa*. DeNicéville suggests that *Plagiosa*, with its densely mottled under-surface, is the winter form of *Hordonia* Stoll. This is also the apparent judgment of collectors on the ground. The Rev. L. C. Biggs, Mr. H. G. Durnford, and Mr. William Doherty, have sent me specimens marked *Hordonia*, which are referable partly to the typical *Hordonia* of Stoll, partly to the two recently erected species of Moore, and show intergrades between all. The slightly increased or diminished width of a band or a spot, the presence of a few more or less speckles on the underside of a wing are hardly sufficient grounds for the erection of new species.

37. **Neptis Eurynome** Westw., in Donovan's Ins. China Pl. XXXV, fig. 4 (1842); *Papilio Leucothoe* Donovan, 1st edit.; *N. Eurynome* Distant, Rhopal. Malayana, p. 156, Pl. XVI, fig. 14.

Numerous specimens ♂ and ♀.

38. **Neptis Ophiana** Moore, Proc. Zool. Soc. London, 1872, p. 561; Distant, Rhop. Malay. p. 153, Tab. XVII, fig. 12; Marshall and DeN., Vol. II, p. 105.

One fine female.

39. **Neptis micromegethes** n. sp.

This species belongs to the second group indicated by DeNicéville. Its expanse is 1.5 inches. The ground color is black, the markings pure white. The discal streak of the fore wings is broad and long, slightly indented at end of cell and not reaching below the third submedian nervule. Three large oblique spots near the apex and four large spots reversely oblique to the middle of the posterior margin. A submarginal band of small white spots interrupted opposite the extremity of the discal streak and bordered on either side by a pale line. Fringe white. Hind wing with discal band broad, straight and even, followed by a pale line, the submarginal white band straight, prominent, gradually diminishing in width from the anal to the outer angle; a pale marginal line beyond. The underside exactly as the upperside, except that the deep black of the upper surface is replaced by fuscous, and the light markings are more prominent and distinct.

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The insect is in many respects near *N. Burmana* DeN., but its expanse is less by nearly one inch, and there is but one marginal line on the underside of the hind wings, the ground color of the underside is fuscous not ferruginous, except at base of costa, where there is a slight tinge of rusty red perceptible.

Genus **EUTHALIA** Hübn.

40. **Euthalia Lubentina** Cram. (*Pap. L.*), Pap. Exot. II, t. 155, C. D. (1779)

One ruined female.

41. **Euthalia Xiphiones** Butl., Proc. Zool. Soc. 1868, p. 609, n. 60, t. 45, fig. 6; Dist., Rhop. Malay. Appendix, p. 439, Pl. XXXVI, figs. 9 and 10.

One fine male.

Genus **SYMPHÆDRA** Hübn.

42. **Symphædra Dirtea** Fabr., Ent. Syst. III, 1, p. 59, n. 184. (1793.)

Three males, one female.

Family LEMONIIDÆ Kirby.

Subfamily NEMEOBIINÆ, Bates.

Genus **DODONA** Hew.

43. **Dodona Henrici** n. sp. Pl. II, fig. 2.

♀. Form of *D. longicaudata* DeN.

UPPER SURFACE.—Ground color white. *Fore wings* fuscous at base, crossed about one-fourth of distance from base by dark fuscous band about one-tenth inch in breadth. A black submarginal band, very wide at costa, where it is cleft by a wedge-shaped spot of white, runs from beyond the middle of the wing to the inner angle, just before reaching which it is bulged outwardly to give place to a conspicuous white lunule which interrupts it. A broad black border, broadest at the apex, covers the outer margin, being broken at each intra-neural space by a small white spot. *Hind wings* with the lines of the fore wings produced upon them, growing narrower and less distinct toward the anal angle. The submarginal band fades into light fulvous, interrupted by two or three black points before reaching the anal angle. The marginal band of black is interrupted by a series of narrow linear white lines parallel to the margin. Tail long, anal lobe black, with white lunate mark on inner edge.

UNDER SURFACE marked as the upper, save that the bands are narrower and more distinct, and of a decidedly ferruginous tint, and what is a broad fuscous shade at the base of the wings upon the upper surface is resolved upon the lower side into three well defined narrow lines with white interspaces. Expanse 1¾ inches.

Type in Coll. Holland.

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There is no mark to indicate the locality of this specimen, but it was probably taken in the hill-country of the interior of the island.

Genus **ZEMEROS** Boisd.

44. **Zemeros Confucius** Wallace, MS. Moore, Proc. Zool. Soc. London, 1878, p. 701.

This appears to be a good species, my specimens which, though not numerous, are in rather poor preservation, for the most part are even smaller than the dimensions given by Mr. Moore.

Genus **ABISARA** Feld.

Sospita Hew.

45. **Abisara Lydda** Hew. (*S. Lydda*), Exot. Butt. III : Dodona and Sospita, figs. 13 and 15; *S. Saturata* Moore, Proc. Zool. Soc. London, 1878, p. 701.

A long suite of specimens, male and female.

Family LYCÆNIDÆ, Steph.

Genus **MILETUS** Hübn.

46. **Miletus Chinensis** Feld., Reise Nov. Lep. II, p. 284, n 364, Pl. 35 figs. 35 and 36.

Two males, one female.

Genus **LYCÆNA** Fabr.

47. **Lycæna Roxus** Godt., Enc. Méth. IX. p. 659, n. 142; Distant, Rhop. Malay. p. 216, Tab. XXII, fig. 24.

48. **Lycæna Aelianus** Fabr., Ent. Syst. III, i. p. 280, n. 79; Distant, Rhop. Malay. p. 228, Tab. XXI, fig. 18. XXII, fig. 19.

49. **Lycæna Bæticus** L., Syst. Nat. I, 2, p. 789, n. 226.

The specimens are much larger than those I have from Italy and Greece.

50. **Lycæna Similis** Moore, Proc. Zool. Soc. London, 1878, p. 702.

51. **Lycæna** sp?

One male.

Genus **THECLA** Fabr.

52. **Thecla Phœnicoparyphus** n. sp. Pl. II, fig. 1.

MALE.—UPPER SURFACE dark brown. *Fore wing* with a wide and irregular subapical spot of deep red. *Hind wings* broadly margined on the exterior with the same color. A series of minute black marginal lunules is followed by the bluish white fringe. Tail long and dark brown in color. UNDER SURFACE bright lustrous ochreous. *Fore wings* narrowly bordered with red, the border widening from apex toward the inner angle, where it is terminated by a quadrate spot of dark gray bordered externally and internally by a narrow line of white. *Hind wings* broadly bordered with dark red, fading into pink at the outer margin. This red marginal band is set off internally by a row of white lunules, one for each intra-neural space, and

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by the minute black crescents on the margin. Antennæ, upper surface of head, thorax and abdomen black. Legs, breast and lower side of abdomen white. Expanse 1¼ inches.

Type in Coll. Holland.

Family PAPILIONIDÆ Leach.

Subfamily PIERINÆ Swainson.

Genus **PONTIA** Fabr.

53. **Pontia Xiphia** Fabr., Spec. Ins. II, p. 43, n. 180.

Several examples.

Genus **TERIAS** Swainson.

54. **Terias Hecabe** L., Syst. Nat. ed. x, p. 470, n. 74. (1758.)

One example.

55. **Terias Anemone?** Feld., Wien, Ent. Mon. VI, p. 23, n. 7.

Two specimens.

56. **Terias Læta** Boisd., Spec. Gen. I, p. 674, n. 36.

Several specimens.

57. **Terias Drona** Horsfield, Cat. Lep. E. I. C. p. 137, n. 64, t. 1, fig. 13. (1892); *T. Hainana*, Moore, Proc. Zool. Soc. London, 1878, p. 700.

Numerous examples which I refer to this species.

Mr. Moore in his paper in the Proc. Zool. Soc. London, 1878, p. 699, etc., gives us a number of new species of *Terias* from Hainan, and one species which he calls *T. Hainana* I am forced to believe is none other than *T. Drona*, named by my kinsman, Dr. Horsfield, in 1829.

Genus **PIERIS** Schrank.

58. **Pieris Canidia** Sparrm., Amoen. Acad. VII, p. 504, note m. (1768.)
P. Gliciria, Cram. Pap. Exot. II, Pl. 171, E. F.

Several males and females.

59. **Pieris Phryne** Fabr., Syst. Ent. p. 473, n. 131; Moore, Lep. Ceylon, Vol. I, p. 136, Pl. 53, figs. 1, 1a. *Pap. Evagete* Cram., Pap. Exot. III, Pl. 221, figs. F and G.

Genus **APPIAS** Hübn.

60. **Appias Inornata** Moore, Proc. Zool. Soc. London, 1878, p. 700.

Differs from *A. Hippo* in the narrower border of underside of hind wings.

61. **Appias Amasene** Cram., Pap. Exot. I, Pl. 44, fig. A.

One male which I doubtfully refer to this species.

Genus **DELIAS** Hübn.

62. **Delias Hierte** Hübn., Zutr. Ex. Schmett. figs. 77, 78.

One fine male.

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Genus **NEPHERONIA** Butl.

63. **Nepheronia Valeria** Cram., Pap. Exot. I. Pl. 85, A.

Apparently common in Hainan. I have a long suite of males and females, the latter being rather more numerous than the former, and mimicking *Danais Aglea* very closely.

Genus **IXIAS** Hübn.

64. **Ixias Pyrene** Linn., Mus. Ulr. p. 241. Cram., Pap. Ex. II, t. 125, A-C.

Several specimens.

Genus **CATOPSILIA** Hübn.

65. **Catopsilia Gnoma** Fabr., Syst. Ent. App. p. 828, n. 152-53; Butl., Lep. Exot. p. 43, Pl. XVI, figs. 1-4.

Male and Female.

Subfamily PAPILIONINÆ Swainson.

Genus **PAPILIO.**

66. **Papilio Agenor** Linn., Mus. Ulr. p. 194; Distant, Rhop. Malay. p. 339, Pl. XXIX, fig. 1.

Two somewhat injured females.

67. **Papilio Esperi** Butl., Trans. Linn. Soc. ser. 2, Zool. Vol. I, p. 553, Pl. 68, fig. 7. Distant, l. c. p. 341, Tab. XXVII, figs. 1 and 6.

Several males.

68. **Papilio Achates** Cram., Pap. Exot. II, Pl. 182, figs. A, B. Distant. l. c. p. 342, Tab. XXVIII, fig. 5.

One female.

69. **Papilio Telephus** Feld., Reise Nov. Lep. I, p. 64, n. 49. Distant, l. c. p. 361.

One male.

70. **Papilio Agamemnon** Linn., Mus. Ulr. p. 202. Distant, l. c. p. 363. Pl. XXXII, fig. 7.

Several examples of the long-tailed variety.

71. **Papilio Sarpedon** L., Mus. Ulr. p. 196. Distant, l. c. p. 359, Pl. XXXII, fig. 6.

Numerous examples.

72. **Papilio Megarus** Westw., Arc. Ent. II, Pl. 79, fig. 2.

Numerous examples, mostly flown and torn.

73. **Papilio Clytia** L., Mus. Ulr. p. 296. Distant, l. c. p. 353, Tab. XXVII b, fig. 2.

Numerous examples, mostly lighter than the figure in Mr. Distant's work.

74. **Papilio Panope** L., Syst. Nat. I, 2. p. 782, n. 196.

Papilio Saturata Moore, Proc. Zool. Lond. 1878, p. 697.

The specimens are all of the dark form named *Saturata* by Mr. Moore. Aside from the fact that the specimens are darker than Indian examples I can detect no difference whatever. Long suites of specimens.

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Boisduval suggested, and I have no doubt that *P. Clytia* and *P. Panope* are simply dichromatic forms of the species. Breeding can alone declare the fact.

75. **Papilio Erithonius** var. *Malayanus* Butl., Trans. Linn. Soc. ser. 2, Zool. Vol. I, p. 552, n. 8.

Apparently excessively common in Hainan.

76. **Papilio Polytes** L., Syst. Nat. ed. x, p. 460, n. 7. *Pap. Pammon* L., l. c. p. 460, n. 8. Dist., l. c. p. 347, Tab. XXIII, figs. 7–10.

Still more common than *P. Erithonius.*

77. **Papilio Aristolochiæ** Fabr., Syst. Ent. p. 443, n. 3.

Several examples of the large typical form.

78. **Papilio Helenus** L., Mus. Ulr. p. 185. Dist., l. c. p. 343. Pl. XXIX, fig. 3.

One male differing considerably on the underside from the figure given by Mr. Distant, yet plainly of the same species.

79. **Papilio Paris** L., Mus. Ulr. p. 184. Drury, Ill. Ex. Ent. I, t. 12, figs. 1–2.

One poor male.

80. **Papilio Nomius** Asp. Eusl. Schmett. t. 52, fig. 3. Moore, Lep. Ceylon, Vol. I, p. 142, Pl. 62, fig. 2. *P. Swinhoei* Moore, Proc. Zool. London, 1878, p. 697.

Large number of males and females. Some specimens have the costal bands a little broader than those of the figure in the *Lepid. of Ceylon*, others might have served the artist as his model. I cannot but regard the name *Swinhoei* as a synonym for *Nomius.*

81. **Papilio Antiphates** Cram., Pap. Exot. I, Tab. 72, A. B. Dist., Rhop. Malay. p. 357, Pl. XXXI, fig. 5. Moore, Lep. Ceylon, Vol. I, p. 142, Tab. 63, figs. 1, 1a.

But one damaged specimen, in which there is much less green on the underside of the wings than in the figures of Cramer, Distant, and Moore.

Family HESPERIDÆ Leach.

Genus BAORIS Moore.

82. **Baoris Chaya** Moore, Proc. Ent. Soc. London 1865, 791. Distant, Rhop. Malay. p. 380, Tab. XXXIV, fig. 9.

Several examples.

83. **Baoris Cingala** Moore, Lep. Ceylon, p. 167, Pl. 70, figs. 3, 3a.

Several examples.

84. **Baoris Distictus** n. sp. Pl. II, fig. 4.

MALE.—*Upper surface* uniformly olive-brown, cilia pale cinereous. *Primaries* with two small, triangular, semi-diaphanous white spots beyond the middle of the wing and between the submedian nervules. *Underside* lighter than the upper, with a hoary lustre, especially on the posteriors. A few scarcely visible light scaleless spots may be

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detected adjacent to the two white spots of the primaries, which reappear on the underside. A curved submarginal row of obscure brown spots is found upon the secondaries. Underside of palpi and head white. Expanse of wings 1⅜ inches.

Type in Coll. Holland.

Genus **TELICOTA** Moore.

85. **Telicota Augias** L., Syst. Nat. I, 2, p. 794, n. 257 (1767). Dist., Rhop. Malay. p. 382, Tab. XXXIV, fig. 23.

Apparently common.

Genus **CYCLOPIDES** Hübn.

Heteropterus Dum.

86. **Cyclopides Henrici** n. sp. Pl. II, fig. 5.

MALE.—*Upper surface* uniformly very dark brown with an olivaceous reflection. *Primaries* with two minute quadrate subapical spots. *Under surface* lighter in color. *Primaries* with subapical white spots as on upper surface; posterior half of the wing darker than the anterior margin. *Secondaries* with two transverse cloudy bands of dark brown upon the lighter ground. Underside of palpi and head white. Expanse 1½ inches.

Type in Coll. Holland.

Genus **ABARATHA** Moore.

87. **Abaratha Sura** Moore, Proc. Zool. Soc. Lond., 1865, p. 786. Distant. Rhop. Malay. p. 390, Tab. XXXIV, fig. 16.

One example.

Genus **UDASPES** Moore.

88. **Udaspes Folus** Cram., Pap. Exot. I, t. 74, fig. F. Dist., l. c. p. 398, Pl. XXXIV, fig. 3.

One fine example.

A comparison of the list given by Mr. Moore of the species taken in Hainan by Mr. Swinhoe shows twenty-nine species not enumerated on the foregoing list as found on the island, while in the foregoing paper there are given forty-six species not mentioned by Mr. Moore. There are thus ascertained to be nearly one hundred and twenty species of Rhopalocera in Hainan, and doubtless future explorations will greatly increase the number. Of this number only about one-fifth appear, to be strictly speaking, new forms, and these are mainly varietal, many of them hardly entitled to specific rank.

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ON THE CYNIPIDOUS GALLS OF FLORIDA, with descriptions of new species and Synopses of the described species of North America.

BY WILLIAM H. ASHMEAD.

In the following pages studies on the cynipidous galls of Florida are continued, and synopses of all those described from America north of Mexico are given.

The tables, which will greatly assist the student in identifying the now numerous described species, have been shaped somewhat in accordance with the "Synopsis of N. A. oak galls" as published in 1865, by Baron Osten Sacken, in the Proceedings of the Entomological Society of Philadelphia. There, about fifty species are tabulated; here, one hundred and forty-three.

It will also be observed that the generic position of many of the species in the tables does not conform with my "Catalogue of the North American Cynipidæ" published in 1885. In explanation of this discrepancy I would say that since then I have secured most of the described species of the N. A. Cynipidæ, many of which were not then in my collection, and their present position is assigned them after a very careful study, and with a knowledge of the generic differences not attained at that time; they will be found now placed in their proper genera, excepting possibly a few species which I have not yet seen.

It is the intention of the writer to publish, early in the spring, a monograph of the North American Cynipidæ, in which will be given tables for determining the genera and species, with full descriptions and illustrations of *all* the genera and generic characters and many of the galls. The work is already well under way, and to make the monograph as complete as possible and to fill up my tables of the species, I would respectfully ask of those interested, their assistance in the way of specimens to be retained or their loan for study. All specimens sent me will be well cared for, accurately determined and returned at the earliest possible moment after being studied. I am particularly anxious for specimens in the subfamilies *Ibaliinæ*, *Allotriinæ* and *Figitinæ*.

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In this memoir (which does not by any means exhaust my material) I describe in the subfamily *Cynipidæ* three new genera: *Solenozopheria*, *Eumayria* and *Bassettia;* and in the subfamily *Figitinæ* several new genera. I have separated the old genus *Eucoila* Westw., from the *Figitinæ* as a subfamily (*Eucoilinæ*) with several well-defined genera, and also describe new species in numerous European genera not before recognized in the North American fauna.

The genus *Solenozopheria* is erected to contain a cynipid making a reniform, pithy gall on huckleberry (*Vaccinium*) which cannot be placed in any of the known genera. Indeed, this is the first instance on record where a cynipidous gall has been found on a plant in the Heath Family (*Ericaceæ*), for in America, cynipidous galls have been found only on the Oak Family (*Cupuliferæ*), genus *Quercus;* Rose Family (*Rosaceæ*), genera *Potentilla*, *Rubus* and *Rosa;* Composite Family (*Compositæ*), genus *Lygodesmia;* Mint Family (*Labiatæ*), genus *Nepeta;* and Night-shade Family (*Solanaceæ*) genus *Solanum*.

In Europe, cynipidous galls have been found in all the above families but one, *Solanaceæ;* and in all the genera but one, *Lygodesmia;* besides in the following additional families and genera: Maple Family (*Aceraceæ*), genus *Acer;* Poppy Family (*Papaveraceæ*), genus *Papaver;* and Grass Family (*Gramineæ*), genus *Triticum;* on additional genera in Mint Family (*Labiatæ*), genera *Glechoma* and *Salvia;* in Rose Family (*Rosaceæ*), genus *Sorbus;* in Composite Family (*Compositæ*), genera *Hieracium*, *Scorzonera* and *Centaurea*. From South America, a cynipid causing a gall on *Acacia farnesiana*, Dr. Mayr erected his genus *Eschatocerus;* and from Africa, in the Cashew Family (*Anacardiaceæ*), genus *Rhus*, his genus *Rhoophilus*.

The above constitutes a complete list of the known food plants of the *Cynipidæ;* and the discovery of a cynipidous gall on a new family of plants, belonging to a new genus, is doubly interesting.

The Synopses following are:

1.—A Synopsis of the North American Cynipidous Oak Galls.

2.—A Synopsis of the North American Cynipidous Rose Galls.

3.—A Synopsis of the North American Cynipidous Bramble Galls.

4.—A Synopsis of the North American Miscellaneous Cynipidous Galls.

1.—A Synopsis of the North American Cynipidous Oak Galls.

Galls on the leaves	Division I.
Galls on branches, twigs and blossoms .	" II.
Galls on the roots	" III.

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Div. I.—*Galls on the leaves.*

A.—Galls not intimately connected with the substance of the leaf, generally fastened by a small portion of their surface and which can be removed without carrying a portion of the leaf with them.

a.—Globular galls with a kernel in the centre kept in position by a softer substance, spongy, fibrous or succulent; or by filaments radiating from it to the shell; all monothalamous.

†.—Kernel kept in position by a dry, spongy substance.

Shell thick . *Amphibolips spongifica* O. S. (Q. tinctoria).

Shell thin . *Amphibolips confluens* Harris (Q. rubra).

Surface glossy . *Amphibolips coccineæ* O. S. (Q. coccinea).

Surface spiny . *Amphibolips spinosa* Ashm. (Q. laurifolia).

††.—Kernel kept in position by delicate, radiating filaments.

Large, shell thin; surface glossy . *Amphibolips inanis* O. S. (Q. rubra, Q. coccinea).

Large, shell thin; surface mottled . *Holcaspis centricola* O. S. (Q. obtusiloba).

Small, smooth, brown . *Dryophanta polita* Bass. (Q. obtusiloba); *Andricus bella* Bass. (unknown oak).

Small, smooth, yellow . *Andricus femoratus* Ashm. (Q. laurifolia).

†††.—Kernel kept in position by a soft, succulent substance; galls resembling green grapes . *Amphibolips sculpta* Bass. (Q. rubra, Q. tinctoria); *A. racemaria* Ashm. (Q. laurifolia).

††††.—Kernel surrounded by a dense, cellular substance.

Galls generally in clusters; shell smooth . *Andricus virens* Ashm. (Q. virens).

Bell shaped . *Acraspis vaccinii* Ashm. (Q. obtusiloba).

Small, pubescent . *Cynips? decidua* Bass. (Q. rubra).

Minute, pubescent . *Dryophanta ignota* (Q. bicolor).

aa.—Hard, globular, or irregularly rounded galls, without a distinct kernel; one, two or more celled, the surface smooth or netted or fissured like a strawberry.

One celled, without spines . *Biorhiza hirta* Bass. (Q. montana); *Acraspis pezamachoides* O. S. (Q. alba).

One celled, with spines . *Cynips echinus* O. S. (Q. agrifolia).

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Two or more celled, with spines . *Acraspis erinacei* Walsh. (Q. alba); *A. echini* Ashm. (Q. bicolor).

One celled, surface not netted, pubescent . *Dryophanta carolina* Ashm. (Q. alba).

aaa.—Globular galls without a distinct kernel . *Andricus utriculus* Bass. (Q. alba).

Minute, jumping gall . *Neuroterus saltatorius* Edw. (Q. undulatus).

Small, pubescent, gall . *Biorhiza mellea* Ashm. (Q. obtusiloba).

b.—Spindle-shaped galls, on a pedicel . *Andricus fusiformis* O. S. (Q. alba); *A. chinquapin* Fitch (Q. chinquapin, Q. bicolor); *Amphibolips cœlebs* O. S. (Q. rubra).

c.—Wooly or hairy galls; spherical, semispherical, wartlike, or irregular, generally along the veins.

Semispherical on mid-vein, covering wheat-like kernels . *Andricus flocci* Walsh (Q. alba); *A. Pattoni* Bass. (Q. obtusiloba).

Kernels irregular . *Andricus lanigerus* Ashm. (Q. virens); *A. nubila* Bass. (oak unknown); *Bassettia tenuicornis* Bass. (oak unknown).

Kernel, a round, flattened disk with a nipple . *Neuroterus laurifoliæ* Ashm. (Q. laurifolia).

Small, wartlike, hairy galls . *Neuroterus verrucarum* O. S. (Q. obtusiloba); *N. minutissimus* Ashm. (Q. virens); *N. floccosus* Bass. (Q. bicolor).

Spherical . *Acraspis lanæglobuli* Ashm. (Q. bicolor); *Andricus infuscatus* Ashm. (Q. catesbæi).

d.—Tubular galls with or without spines.

With spines . *Andricus tubicola* O. S. (Q. obtusiloba).

AA.—Galls intimately connected with the substance of the leaf, so that they cannot be taken off without carrying a portion of the leaf with them.

a.—Globular, hollow, monothalamous galls.

†.—Kernel in the centre kept in position by filaments radiating from it to the shell . *Amphibolips nubilipennis* Harris (Q. rubra); *Andricus? singularis* Bass. (Q. rubra); *A. Osten Sackenii* Bass. (Q. ilicifolia, Q. coccinea).

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††.—Kernal cocoon-like, rolling freely about within the cavity

Galls globular, projecting on both sides of the leaf . *Dryophanta palustris* O. S. (Q. palustris); *D. laurifoliæ* Ashm. (Q. laurifolia); *D. aquaticæ* Ashm. (Q. aquatica); *D. quercifolæ* Ashm. (Q. catesbæi).

Galls semiglobular, not projecting above the upper surface of leaf . *Dryophanta notha* O. S. (Q. palustris); *D. confusa* Ashm. (Q. laurifolia); *D. cinereæ* Ashm. (Q. cinerea).

b.—Swellings or expansions of the leaf ribs; mostly polythalamous.

†.—Juicy, irregular swellings of the blade of the leaf; of a cellular, pithy structure when dry . **Neuroterus majalis* Bass. (Q. alba, Q. prinus); **N. irregularis* O. S. (Q. obtusiloba).

††.—Cellular swellings of the leaf, usually along the principal ribs; they contain numerous seed-like kernels . *Andricus piger* Bass. (Q. tinctoria); *Callirhytis tumifica* O. S. (Q. tinctoria); *C. modesta* O. S. (*A. rubra*); *C. nigræ* O. S. (Q. nigra); *C. cellæ* Ashm. (Q. laurifolia).

†††.—Non-juicy expansions of the leaf, with two or three seed-like kernels in the centre kept in position by filaments or a cellular substance . *Callirhytis futilis* O. S. (Q. alba); *C. papillatus* O. S. (Q. prinus, Q. prinoides).

Small, papillose, cone-like galls in clusters . *Dryophanta papula* Bass. (Q. rubra, Q. tinctoria).

††††.—Globular, hard expansions of the leaf, at the basis of the leaf, or on the principal leaf-rib, part appearing above the leaf cone-shaped; below rounded . *Andricus quinqueseptum* Ashm. (Q. obtusiloba); *A. petiolicola* Bass. (Q. montana); *A. parvifoliæ* Ashm. (Q. parvifolia).

†††††.—Hard, prone circular galls sessile on the under surface of the leaf not appearing on the upper surface *Andricus rugosus* Ashm. (Q. laurifolia); *Cynips? cicatricula* Bass. (Q. alba).

* These two species are probably identical; *N. irregularis* O. S. having the priority. It will form the type of a new genus *Dolichostrophus m.*

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Div. II.—*Galls on the branches, twigs and blossoms.*

A.—Galls of a different substance than the limb and which can be taken off without carrying a portion of the limb with them.

a.—Globular galls, with a kernel in the centre kept in position by a softer substance, spongy, fibrous or succulent; or by filaments radiating from it to the cell; all monothalmous.

†.—Kernel kept in position by a dry, spongy substance . *Amphibolips cinerea* Ashm. (Q. cinerea).

††.—Kernel kept in position by delicate radiating filaments.

Attenuated and pointed at tip . *Amphibolips citriformis* Ashm. (Q. laurifolia).

Rounded, not pointed at tip . *Amphibolips melanocera* Ashm. (Q. aquatica).

†††.—Kernel surrounded by a hard cellular or woody substance; sometimes but slightly imbedded in the surrounding substance.

a.—Monothalmous . *Holcaspis mamma* Walsh (Q. macrocarpa); *A. fuliginosa* Ashm. (Q. laurifolia); *Andricus cinerosus* Bass. (Q. virens); *Callirhytis agrifoliæ* Bass. (Q. agrifolia); *Cynips? juglans* O. S. (Q. prinus); *Holcaspis globulus* Fitch (Q. alba); *H. omnivora* Ashm. (Q. obtusiloba, Q. parvifolia); *H. rugosa* Bass. (Q. prinoides, Q. prinus, Q bicolor).

aa.—Polythalamous; galls very large, cellular structure . *Andricus pomiformis* Bass. (Q. agrifolia).

Hard, woody structure . *Callirhytis Suttoni* Bass. (oak unknown).

††††.—Kernel surrounded by juicy substance; gall issuing from the side of an acorn . *Amphibolips prunus* Walsh (Q. ———).

b.—Bud galls; galls issuing generally from a bud axil, hidden and enclosed in a bud, or surrounded by bud scales, or deformed lanceolate leaflets.

†.—Hard, conical galls; the tips sometimes curved.

Occurring separately or singly . *Andricus coniferus* Ashm. (Q. laurifolia).

Occurring several together, often coalescing . *Andricus ventricosus* Bass. (Q. ilicifolia).

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††.—Oblong, ovate galls in clusters and ribbed like a melon; monothalamous.

Divided lengthwise into partitions . *Andricus formosus* Bass. (Q. rubra, Q. ilicifolia); *A. capsualus* Ashm. (Q. cinerea, Q. catesbæi).

Without partitions, jumping . *Andricus saltatus* Ashm. (Q. catesbæi, Q. cinerea).

†††.—Galls in the buds . *Andricus calycicola* Ashm. (Q. laurifolia); *Neuroterus? vesicula* Bass. (Q. alba); *N. affinis* Bass. (Q. prinoides); *N. minutus* Bass. (Q. alba); *Dryophanta gemula* Bass. (Q. prinoides).

Suppositious bud gall . *Holcaspis? corrugis* Bass. (Q. prinoides).

††††.—Leafy bud galls; clusters of small, narrow, deformed leaflets, issuing from a bud axil and surrounding one or more kernels.

a.—Monothalamous.

Gall very large; kernel smooth . *Andricus frondosa* Bass. (Q. alba).

Galls very large; kernel rugose . *Andricus foliatus* Ashm. (Q. virens).

Gall small, kernel smooth . *Andricus stropus* Ashm. (Q. obtusiloba); *A. cinnamomeus* Ashm. (Q. parvifolia).

aa.—Polythalamous; kernels very small, smooth . *Andricus topiarius* Ashm. (Q. obtusiloba).

c.—Galls on the blossoms.

Small, globular, wooly gall, containing numerous seed-like kernels . *Andricus Turnerii* Ashm. (Q. aquatica).

A minute, seed-like kernel occurring singly on aments . *Andricus blastophagus* Ashm. (Q. cinerea); *Dryophanta gemula* Bass. (Q. prinoides).

d.—Wooly galls; globular or irregular, containing numerous seed-like kernels inside . *Callirhytis seminator* Harris (Q. alba, Q. bicolor, Q. prinus); *C. operator* O. S. (Q. nigra, Q. ilicifolia, Q. palustris).

E.—Fig galls; irregular and hard, or soft, thin shelled, bladder-like galls crowded together around a limb, so pressing and crowding upon each other as to resemble pressed figs.

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e.—Thin shelled, resembling pressed figs . *Biorhiza forticornis* Walsh (Q. alba).

More rounded . *Holcaspis ficula* Bass. (Q. macrocarpa, Q. obtusiloba, Q. parvifolia).

Pine-cone shaped . *Cynips strobilana* O. S. (Q. bicolor).

ee.—Thick shelled, hard . *Holcaspis ficigera* Ashm. (Q. virens).

Rounded, not compressing each other . *Holcaspis succinipes* Ashm. (Q. virens).

AA.—Galls comprising swellings of the branches and twigs and which cannot be removed without carrying a portion of the branch or twig with them.

†.—Terminal or subterminal swellings of the limb; either of a hard woody structure or of a soft cellular substance.

a.—Monothalamous; of a hard, woody structure . *Callirhytis clavula* Bass.

Syn. *C. arbos* Fitch, *C. tuber* Fitch (Q. alba); *Neuroterus phellos* O. S. (Q. phellos); *C. similis* Bass. (Q. ilicifolia); *C. aquaticæ* Ashm. (Q. aquatica).

aa.—Polythalamous; of a soft, cellular substance . *Neuroterus batatus* Bass.—Syn. *Cynips batata* Fitch. (Q. alba).

††.—Swellings in the middle of the branch; all polythalamous.

b.—Of a soft, cellular structure . *Andricus batatoides* Ashm. (Q. virens); *Neuroterus noxiosa* Bass. (Q. bicolor).

bb.—Of a hard, woody structure . *Andricus Coxii* Bass. (Q. agrifolia); *A.? floridanus* Ashm. (Q. parvifolia); *Callirhytis punctata* Bass. (Q. rubra); *C. podagræ* Walsh (Q. nigra); *C. scitula* Bass. (Q. tinctoria); *C. californica* Bass. (Q. Hindsii); *Neuroterus Rileyi* Bass. (Q. castanea).

bbb.—With spines or fusiform tubes . *Callirhytis cornigera* O. S. (Q. palustris); *Andricus clavigerus* Ashm. (Q. laurifolia).

†††.—Larval cell hidden under the bark . *Andricus cryptus* Ashm. (Q. catesbæi); *Biorhiza nigra* Fitch (Q. alba).

††††.—Swellings surrounding the base of new shoots or twigs; hard, woody structure.

d.—Small size . *Andricus catesbæi* Ashm. (Q. catesbæi); *N. longipennis* Ashm. (Q. laurifolia).

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dd.—Large size . *Loxaulis mammula* Bass. (Q. alba, Q. parvifolia).

F.—Tubular, fusiform, round, or oval shaped galls, issuing from fissures in a branch or twig; occurring always in clusters.

Tubular or fusiform galls surrounding a terminal twig . *Andricus gemmarius* Ashm. (Q. cinerea).

Rugose, oval galls, the rugosities in ridges . *Andricus difficilis* Ashm. (Q. cinerea, Q. catesbæi).

Div. III.—*Galls on the roots.*

Soft, fleshy, polythalamous gall on the rootlets . *Belonocnema Treatæ* Mayr.—Syn. *Dryorhyoxenus floridanus* Ash. (Q. virens).

Hard, polythalamous gall, rounded, and composed of many hard larval cells . *Eumayria multiarticulata* Ashm. (Q. laurifolia).

2.—A Synopsis of the North American Cynipidous Rose Galls.

A.—Galls on the leaves.

Small, globular galls, covered with white efflorescence; monothalamous . *Rhodites carolina* Ashm. (Rosa carolina).

B.—Galls on the stem or branches.

Hard cells, surrounding a branch, covered with green moss-like filaments; polythalamous . *Rhodites rosæ* Linn. (Rosa rubiginosa).

Irregular, abrupt, woody swellings of the branch about two inches long; polythalamous . *Rhodites dichlocerus* Harris (Rosa carolina).

Small, rounded swellings of the branch, somewhat hollow internally; polythalamous . *Rhodites verna* O. S. (Rosa blanda).

Abrupt, rounded swellings surrounding smaller twigs and branches, of a hard, pithy structure, seldom over an inch long; polythalamous . *Rhodites ignota* O. S. (Rosa lucida and R. carolina).

Small, round galls covered with prickles, sometimes coalescing; monothalamous . *Rhodites bicolor* O. S. (Rosa ? carolina).

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Elongated swellings of the twigs covered with dense prickles; polythalamous . *Rhodites spinosa* Ashm. (Rosa rubiginosa).

C.—Galls on the roots.

Rounded, warty gall; polythalamous . *Rhodites radicum* O. S. (Rosa carolina).

3.—A Synopsis of the North American Cynipidous Bramble Galls.

A.—Galls on the stem or branches.

An abrupt, pithy swelling surrounding the stem; polythalamous *Diastrophus turgidus* Bass. (Rubus strigosus).

An abrupt, elongated, longitudinally furrowed, pithy swelling surrounding the stem, from two to over three inches long; polythalamous . *Diastrophus nebulosus* O. S. (Rubus villosus).

Small, round, seed-like galls surrounding a branch, in clusters; monothalamous . *Diastrophus cuscutæformis* O. S. (Rubus villosus, R. canadensis and R. cuneifolium).

B.—Galls on the roots.

Irregular, fleshy galls from the size of a pea to two inches or more in length; polythalamous . *Diastrophus radicum* Bass. (Rubus villosus).

4.—A Synopsis of Miscellaneous Cynipidous Galls.

Small, oblong, spongy galls in leaf axils of Cinquefoil (Potentilla canadensis); monothalamous . *Diastrophus potentillæ* Bass.

Rounded, thin walled galls, with cells held in place by coarse fibres, growing on the leaves, petioles and occasionally on stem of the catnip (Nepeta glechoma); polythalamous . *Diastrophus similis* Bass.

Small, rounded galls with the larval cell held in place by a dense, white, spongy substance, occurring on Lygodesmia juncea . *Antistrophus pisum* Walsh.

Irregular, egg-shaped cells connected by fleshy, potato-like matter on the Potato (Solanum tuberosum) . *Tribalia batatorum* Walsh.

A reniform, pithy gall on the stem or branches of Vaccinium corymbosum and V. pennsylvanicum . *Solenozopheria vaccinii* Ashm.

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CYNIPIDOUS GALLS OF FLORIDA.

Subfamily CYNIPINÆ.

Galls on the Post Oak (Quercus obtusiloba).

To the galls already recorded as occurring on this oak in Florida I have to add the following:

1. **Dryophanta polita** Bassett.
Cynips polita Bass., Can. Ent. vol. xiii, p. 56.

This is found most abundantly on the variety of the post oak known as *Quercus parvifolia;* begins developing early in May, but does not reach maturity until the last of December. The flies remain in the galls and do not attempt to escape until the last of February and during March.

2. **Loxaulis mammula** Bassett.
Cynips mammula Bass., Can. Ent. vol. xiii, p. 76.

This very rare insect I took nearly two years ago on the same species of oak, *Quercus parvifolia;* although Mr. Bassett records it as occurring north on the white oak, *Quercus alba;* as with him the flies escaped the middle of July. It is very rare and in only one instance have I found it. My specimens seem to be darker on the thorax and abdomen than the types of Mr. Bassett's sent me by Dr. Mayr.

By a typographical error, this species is omitted in my catalogue, *Loxaulis* being printed over the species belonging to the genus *Holcaspis.*

3. **Holcaspis ficula** Bassett.
Cynips ficula Bass., Can. Ent. vol. xiii, p. 75.

This is a very common species, found on both varieties of the post oak; Mr. Bassett described it from a burr oak, *Q. macrocarpa.*

The gall begins developing in August, the fly reaching maturity and escaping the last of November and in December.

4. **Nenroterus verrucarum** Osten Sacken.
Cynips verrucarum O. S. Proc. Ent. Soc. Phil. i, p. 62.

This species is rare; begins developing in September, but the fly does not escape until March.

5. **Andricus Pattoni** Bassett.
Cynips Pattoni Bass., Can. Ent. vol. xiii, p. 98.

A common species; begins developing in August, but the flies do not escape until February and March.

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6. **Andricus topiarius** n. sp.—(The Leafy Bower Gall.)

Galls.—In general appearance exactly similar to *Cynips frondosa* Bass., but not so large, comprising a cluster of small, deformed, lanceolate leaflets, with from three to five small, smooth, oval cells in its matrix; these cells are deciduous, measure but .06 or .07 of an inch in diameter and like other leafy galls fall to the ground on reaching maturity.

Gall-fly.—♀. Length .09 of an inch. Color: uniform red-brown, punctate; eyes dark brown; antennæ 13-jointed, slightly longer than thorax and very slightly thickened towards tip; thorax with the usual grooves, so characteristic of this genus, only not so distinctly apparent as usual, the median longitudinal line being faintly traceable, as well as the two short lines on the shoulders; scutellum rugoso-punctate, cushion-shaped with two small, oblique foveæ at base; abdomen polished, second segment occupying more than half the length of abdomen, third, fourth and fifth segments subequal; wings hyaline, veins hyaline, so clear as to be traced with difficulty, the radial area open, areolet so pale as to be invisible, excepting when held up to the light, then it is seen to be distinct; cubitus obsolete.

Described from two ♀ specimens bred March, 1886. It is terribly preyed upon by parasites; have bred from it *Eurytoma studiosa* Say, a *Torymus*, a *Synergus*, a *Ceroptres*, and a *Platygaster* with clavate legs.

7. **Andricus stropus** n. sp.—(The Leafy-wreath Gall.)

Galls.—A diminutive, brown, acorn-shaped gall, issuing from a bud axil, surrounded at base with small, narrow, dense leaflets. The gall, itself, when removed from its leafy matrix is oblong-oval; in height .15 inch; diameter through .10 inch, and has a little nipple on top. It, too, drops to the ground, but unlike the other species just described, there is but one cell to each gall.

Gall-fly.—♀. Length .10 inch. Head and thorax dark brown, finely punctate, subopaque. Head obfuscate on vertex; ocelli black; antennæ 14-jointed, yellowish brown, infuscated at tips; thorax considerably shorter than abdomen, parapsidal grooves distinct, the median groove obsolete, a slight trace of it visible in front, with, two short subobsolete grooves in front on either side of it, scutellum rugoso-punctate, pubescent; pleuræ coriaceous; legs reddish brown, pubescent, and slightly obfuscated; abdomen black, smooth and shining, a few sparse whitish pubescence on sides of second segment; wings hyaline, veins brown, radial area open, areolet distinct, the cubital cell nearly closed.

Described from several specimens bred March, 1886.

8. **Acraspis vaccinii** n. sp.—(The Huckleberry-like Gall.)

Galls.—"Clusters of small, somewhat bell-shaped, petiolate, greenish galls on the under side of the leaves, along the midrib. Their shape may be compared to that of the flowers of *vaccinium*. They are attenuated at the basis into a short petiole, fastened to the midrib of the leaf; the opposite end is truncated the truncature being excavated; the length, from the foot of the petiole to the truncated end, is from 0.12 to 0.15 inch. They grow in numbers, sometimes of ten or more together, so that six, for instance, form a row on one side of the midrib and four or five on the opposite."—Osten Sacken.

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Gall-fly.—♀. Length .08 inch. Head and thorax dull brown; abdomen black, shining (one specimen distinctly brownish at base, antennæ 14-jointed, rather long, tip from eighth joint infuscated; parapsidal grooves very indistinct; scutellum ending in a small elevated horn; all tibiæ dark-brown along outer edges. Entirely apterous without even wing scales.

Described from two specimens bred in February, 1886.

This gall is common; begins developing in August, but does not reach maturity until last of December. I have found the same gall on the Post Oak at Asheville, N. C. Baron Osten Sacken mentions having found this species in his second paper on North American Oak Galls 1862, p. 255, from whom the description of the gall is taken; he did not, however, breed the fly.

9. **Andricus cinnamomeus** n. sp.

Gall.—A small, cone shaped bud gall .35 to .40 inch long by .15 to .17 inch in diameter, covered with short deformed leaf scales. The egg is evidently deposited in the fall or midsummer, causing an abnormal development of the bud and bud scales, which cover the gall. The larval cell is thin, whitish in color, cocoon shaped and attached to one side, at the base of the gall. One might easily cut into and open the gall without finding it, for unless he accidentally cuts into the side where the cell is situated, it would remain undiscovered.

Gall-fly.—♀ Length .10 inch. Color a uniform bright cinnamon red, excepting the dark brown or black eyes. Antennæ 13-jointed, reaching beyond the base of the abdomen; head and thorax punctate, sparsely pubescent, parapsidal grooves well defined; legs sparsely pubescent; abdomen ovate, second segment prolonged; sheaths porrect, ventrally; wings glassy hyaline, veins pale, the areolet and cubitus obsolete, although in two specimens they are faintly traceable.

Described from several specimens bred April, 1887. Occurs on *Quercus parvifolia.*

10. **Andricus? floridanus** n. sp.

Galls.—Hard, irregular swellings of a branch or the stem close to the ground, never very high up, from half an inch to three or more inches long by not more than half an inch in diameter. Some specimens might easily be confounded with *Andricus batatoides m.*, *Andricus medullæ m.*, or *Neuroterus Rileyi* Bass., but the gall producer is very distinct from any of these.

Gall-fly.—♂ ♀. Length .12 to .17 inch. Color dark brown, abdomen reddish brown polished. Antennæ ♀ 16, ♂ 17 jointed, as long as the whole body, slender, nearly the same thickness throughout. Head and thorax punctate, pubescent, cheeks well rounded; scutellum cushion shaped, pubescent, foveæ indistinct; abdomen ovate, slightly compressed; wings hyaline, veins brown, radial vein reaching costal edge; areolet distinct; cubital cell closed, the cubital nervure does not quite reach apical margin.

Described from several specimens. This species in its antennal characters is very distinct from any described species in the Cynipinæ, no ♀ yet described having sixteen joints in the antennæ; but it seems so closely related to the genus *Andricus* that it may be placed there temporarily. It is found on *Q. parvifolia.*

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11. **Biorhiza mellea** n. sp.

Galls.—Small, brownish yellow, globular galls, occurring separately or in clusters of three or more together, on the upper surface of the leaf, attached by a slender point and easily detached Externally they are covered with minute warty, pubescent dots; internally they are fleshy, but when fully matured are of a more or less cellular consistency and shrivel in drying. Diameter .10 to .15 inch. They fall to the ground and mature in the sand and fallen débris.

Gall-fly.—♀. Length .07 inch. Color uniform dark honey yellow, eyes brown Head finely punctate; thorax smooth, polished, parapsidal grooves distinct; scutellum rugose; wings rudimentary; abdomen large, longer than head and thorax combined, compressed and vertically as broad as long.

Described from eight specimens reared in February. Occurs on *Q. parvifolia.*

12. **Callirhytis parvifoliæ** n. sp.

Gall.—A small rounded gall on the midvein of a leaf, half projecting above and half below the surface of the leaf, and usually but not always, the portion above the upper surface, is deeply indentated. It is polythalamous and contains several larval cells all radiating from the centre. Diameter .12 to .15 inch.

Gall-fly.—♀. Length .06 inch. Color: head, thorax and abdomen black, antennæ and legs brownish yellow. Head and thorax microscopically punctate, only apparent with a high power lens, shining; antennæ 13-jointed, short, reaching only to base of scutellum; thorax with two delicately defined parapsidal grooves and the usual two short anterior median grooves faintly traceable: scutellum large, foveæ distinct, contiguous; abdomen a little longer than thorax, compressed, polished, the second segment occupies not more than half its whole length, all the other segments visible, gradually subequal; sheaths short not pubescent at tip; wings hyaline, finely pubescent, veins pale, excepting basal vein and the submarginal from its junction with the basal; areolet distinct, cubital cell half closed.

Described from two specimens. This gall is not rare on *Q. parvifolia*, but all the flies reared, except the two above, were guest-flies.

Galls on the Swamp Chestnut Oak (Quercus prinus).

This oak grows to an immense height in our swamp-hammocks and from it I have taken several interesting galls identical with some found north on the white oak (*Quercus alba*).

13. **Callirhytis seminator** Harris.

Cynips seminator Harris, Ins. Inj. Veg. p. 548. Fitch, 2d Rep. p. 315.

This species, before only recorded as occurring on the white oak (*Quercus alba*), is not uncommon here, both on *Quercus prinus* and on the swamp white oak *Quercus bicolor.*

Callirhytis operator O. S., occurring on the black-jack (*Q. nigra*) may be a phytophagic variety of this well known species; the galls are similar, but the flies are certainly distinct. I have both species in my collection.

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Callirhytis seminator begins to develop here, on the small twigs, in April; by the middle of June the flies are fully developed, but they do not escape from the galls until the first week in July.

14. **Holcaspis rugosa** Bassett.
Cynips rugosa Bass., Can. Ent. vol. xiii, p. 100.

This species was inadvertantly left out of my Catalogue; Mr. Bassett says it occurs north on *Quercus prinoides*, an oak very closely related to the present species. Here, I find it common on *Quercus prinus* and *Quercus bicolor;* it seems to be identical with the species described by Baron Osten Sacken as *Cynips juglans*, but the fly was not characterized and there is still uncertainty as to its being the same gall.

The gall begins to develop early in September; by the last of November the flies are fully matured, but do not escape until the last of December and early in January. By the middle of January nothing remains in the galls but parasites or parasitic larvæ.

15. **Neuroterus majalis** Bassett.
Cynips majalis Bass., Proc. Ent. Soc. Phil. iii, p. 63.

Mr. Bassett records this species also from the white oak (*Quercus alba;* I have found it here on *Quercus prinus*.

Galls on the Swamp White Oak (Quercus bicolor).

This oak is considered by many botanists only a variety of *Quercus prinus;* galls found on one are very apt to be found on both, and insects are good botanists; all the galls found on *Quercus prinus* and recorded above were also found to occur on it.

The two following species, which are undescribed, seem to be confined entirely to this oak, as I have not been able to find them on *Quercus prinus*.

16. **Acraspis lanæglobuli** n. sp.—(The Wooly Globe *Acraspis*.)

Galls.—Round or globular galls, slightly attached to the under surface of the leaf: .30 to .35 of an inch in diameter and covered with a fine, dense, grayish pubescence; internally, of a pithy structure, with a large, thin-shelled kernel in the centre.

Gall-fly.—♀. Length .16 to .18 inch. This species in size and general appearance very closely resembles *Acraspis echini* Ashm., but differs as follows: mandibles black; antennæ brown-black from sixth to terminus, although the fifth joint is also sometimes black or black at base; the legs are not obfuscated and the posterior coxæ is very hairy; the abdomen at base is pale and the terminal segments are blackish.

Described from eight ♀ bred specimens.

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17. **Acraspis echini** n. sp.—(The Echinus *Acraspis*.)

Galls.—Precisely similar to the galls of *Acraspis erinacei* Walsh, netted or fissured like a strawberry and covered with spiny prickles as in that species, only the gall is never so large and the netted surface is slightly coarser. The majority of the specimens are two-celled, although occasionally four-celled; when this happens, which is seldom, I think it is occasioned by the union of two galls; they are never eight-celled, as is sometimes the case with *Acraspis erinacei* W.

Gall-fly.—♀. Length .13 to .15 inch. Color reddish brown. Head and thorax finely rugose; eyes dark brown; ocelli red, shining; antennæ 14-jointed, about as long as the whole body, filiform, dark brown above, paler beneath, first joint and some of the other joints at tip, slightly yellowish, joints to eighth long and slender, the third joint being the longest, joints from eighth to tip short, the terminal joint being slightly longer than antepenult; thorax slightly pubescent, parapsides distinctly visible posteriorly; scutellum ending in a blunt, but not a very distinct horn, pubescent; wings in the form of two oblong white scales as long as hind coxæ; legs reddish brown, more or less obfuscated, particularly along the outer edges of tibiæ, pubescent; abdomen bright reddish brown, smooth and shining, compressed, vertically it is as wide as long, the sheaths of ovipositor projecting and thickly tufted with hairs; sides of second segment but slightly pubescent.

Described from numerous specimens bred in November. Specimens of *Acraspis erinacei* Walsh, from the white oak (*Quercus alba*) are in my collection; the flies are smaller and very distinct from this species.

Galls on the Laurel Oak (Quercus laurifolia).

To the numerous galls occurring on this oak, recorded in my previous papers I have the pleasure of adding the following new species:

18. **Neuroterus longipennis** n. sp.—(The Long-winged *Neuroterus*.)

Galls.—Small, oblong, irregular, woody swellings, surrounding the base of new shoots, from .35 to .40 of an inch in length, by from .14 to .16 inch in diameter.

Gall-fly.—♀. Length .04 to .05 inch. Black, smooth and shining. Antennæ and legs including *all* coxæ, yellowish, thorax smooth, without parapsidal grooves, although in certain lights there are opaque lines; scutellum tumid, finely rugoso-punctate; abdomen very small, black, shining; wings hyaline, very long, measuring nearly .08 inch from base to tip, the radial area is open, and is very large and long, the areolet is distinct and the cubital cell is closed, the cubitus being, however, very pale.

Described from eight specimens bred May, 1886.

19. **Neuroterus laurifoliæ** n. sp.—(The Laurel-oak Wooly Gall.)

Gall.—An oblong, wooly gall on the upper or lower surface of the leaves; the wool is fawn colored, long and fine, covering three or four, sometimes more irregularly rounded, flattened disks, in the centre of which live the flies; they are attached to the midrib by a nipple-like point; the disk or cell is concave above and measures .08 to .10 inch in diameter.

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Gall-fly.—♀. Length .05 inch. Black, smooth and shining. Antennæ pale yellowish brown; legs pale yellowish, all tibiæ and femora more or less infuscated in the middle, black or brown; abdomen large, globose, black and shining; wings hyaline, radial area open, very long and narrow, areolet distinct, cubital cell open; length of wing hardly .06 inch.

Several specimens bred. The fly very strikingly resembles *Neuroterus verrucarum*, but the gall is very distinct and cannot be confounded with it.

20. **Amphibolips spinosa** n. sp.

Gall.—A small, brown globular gall, covered with prickles or spines; the shell is thick and covers with a slight spongy substance, a thin larval cell; diameter .30 inch.

Gall-fly.—♀. Length .18 inch. Color reddish brown, finely sparsely pubescent. It closely resembles *Amphibolips citriformis*, and can only be distinguished by its slightly darker color, less coarsely rugose thorax, more densely pubescent legs. The basal vein, tip of submarginal vein and the cloud at base of marginal cell are distinctly black; the areolet, too, is smaller than in that species.

Described from one specimen reared in January.

21. **Andricus femoratus** n. sp.

Gall.—A small, very thin shelled globular gall, containing a larval cell held in place by fine radiating filaments; diameter .30 inch.

Gall-fly.—♀. Length .12 inch. Head and thorax brown-black, coarsely rugosely punctate, the parapsidal grooves almost obliterated by the coarse sculpture, as in the genus *Amphibolips*. Antennæ and legs pale yellowish brown, the posterior femora very greatly swollen, as in certain *Chalcids*, black. Abdomen black, polished, second segment greatly lengthened. Wings dusky hyaline, pubescent, cubital cell not quite closed.

Described from one specimen reared May, 1886. It is very remarkable and interesting from its swollen femora, but with this exception does not depart from many normal species in the genus.

22. **Andricus calycicola** n. sp.

Gall.—A small, smooth, hard, but thin shelled globular gall form .10 to .15 inch in diameter, issuing from a bud, but occasionally enclosed by the bud scales or by an aborted acorn cup. This gall develops very rapidly in the fall (October) and it drops to the ground where under the fallen débris the final transformations of the single enclosed larva is consummated, gnawing its way out of the gall in February.

Gall-fly.—Color brownish yellow, posterior tibiæ dusky; eyes and abdomen black. Head and thorax rugoso-punctate as in the preceding species; antennæ 13-jointed; wings hyaline, glassy, veins yellowish, the marginal vein pale, areolet small, its surrounding veins pale and faint, cubitus subobsolete.

23. **Callirhytis cellæ** n. sp.

Gall.—A slight fleshy swelling along midvein, covering two or more small cells; diameter of cells .08 to .10 inch.

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Gall fly.—♀. Length .08 inch. Color black, legs brownish yellow, antennæ dusky. Head and thorax finely punctate; antennæ 13-jointed; abdomen polished black, ventral valve projecting, its tip pubescent; wings hyaline, veins pale yellowish.

Described from two specimens taken out of galls in September, 1885, since which time I have failed to secure additional specimens.

Galls on the Upland Willow or Blue Jack Oak (Quercus cinerea).

To the seven species, described by me, as occurring on this oak, I add four new species: one a "Jumping Gall" of great interest, taking *one whole year to develop;* another a minute gall found on the blossoms or aments; and still another, *Andricus difficilis*, which has taken me just six years to work up.

24. **Andricus** (**Trisolenia** n. g.) **saltatus** n. sp.—(The Blue Jack Jumping Gall.)

Galls.—Oblong-oval, longitudinally ribbed, brown galls, without a distinct cell, occurring two or three together and issuing from the bud axils in early spring; they are but slightly attached and fall to the ground on the slightest jarring of the tree.

Gall-fly.—♀. Length .17 inch. Head and thorax dark brown-black, finely rugoso-punctate, opaque; ocelli red, shining; antennæ 16-jointed, as long as thorax, pale brown; parapsidal grooves distinct, with a distinct median groove between, some punctures along the edges and two short parallel grooves, one on either side of median groove parallel with it, but only extending half way on the mesothorax: between the parapsidal grooves and the groove extending from base of wing is another short longitudinal groove; scutellum coarsely reticulately rugose, with two large, shallow, oblique, shining foveæ at base; pleuræ striate in front, becoming rugose posteriorly; legs reddish brown, the thighs and outer edges of femora and tibiæ obfuscated, punctate and pubescent; coxæ black, smooth and shining above; beneath pubescent. Abdomen dark reddish brown, shining, with a few hairs on sides of second segment. Wings hyaline, veins pale brown, slightly yellowish, submarginal brown, stouter, radial area open, the areolet very large, distinct, cubital cell only half closed. The ♂ differs from ♀ in having 17-jointed antennæ and being almost entirely a pale reddish brown; the femora and tibiæ are but slightly obfuscated.

Described from several specimens.

This gall was discovered three years ago; it appears the last of March, and when first taken from the tree and for several weeks afterwards, has the power of jumping, due to the contractions and sudden relaxation of the larva within; some of them will jump three-quarters of an inch off the table. Out of nearly two hundred galls gathered the first year of its discovery, but one reached maturity; all the rest died. This specimen was just eleven months and some days in the gall. In 1885 but three specimens were raised, one a

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male, and the period of development was the same. This year all my specimens seem to be dead, although I collected at different times and endeavored as far as possible to collect the most matured specimens; evidently the season was too dry for them. Last March I collected two females while ovipositing in the buds; the ovipositor was so deeply immersed in the bud as to enable me to capture the flies in my fingers before they had time to withdraw and escape; they agreed perfectly with the bred specimens.

25. **Andricus difficilis** n. sp.—(The Difficult Gall.)

Galls.—Small, irregularly rounded, densely rugose, grayish galls, slightly flattened at sides, the rugosities arranged transversely in from five to six rows; diameter through flattened sides .08 to .10 inch; crossways .12 to .15 inch; height .12 to .15 inch. These galls occur in clusters, issuing in rows from fissures or slits in the terminal twigs; when mature they fall to the ground.

Gall-fly.—♀. Length .14 inch. Color reddish brown. Head finely punctate, a dark brown streak on face, extending from base of antennæ to clypeus; eyes and ocelli dark brown. Antennæ 14-jointed, a little longer than head and thorax together, yellowish brown, slightly infuscated at tips; thorax almost smooth, shining, with distinct parapsidal grooves, a median groove and a slight groove near base of wings; pleuræ dark brown, pubescent, the meso-pleuræ showing fine, short, microscopical striæ; scutellum rugose not pubescent; legs uniform yellowish brown, coxæ black; abdomen reddish brown, shining, showing its surface, under a high-power lens, microscopically punctate, the second segment does not occupy nearly one-half the length of abdomen with a few hairs at its sides, the other segments are about equal in length; wings hyaline, veins brown, the radial area open, the radial vein undulated at tip, areolet distinct, cubital cell almost closed, the cubitus ending just before reaching the first transverse; there is a slight yellowish cloud in the break in the second longitudinal vein, and along the edge of the first transverse and second transverse veins.

Described from four specimens.

For six years I have been trying to rear the originators of this gall and only succeeded this fall; I have either collected the galls too soon or too late. On my return from the mountains of North Carolina, September 15th, I found a few galls which still retained flies, and from which the above description is drawn up. The flies evidently escape from the galls by the last of August or early in September.

26. **Andricus blastophagus** n. sp.—(The Pollen-feeding *Andricus.*)

Galls.—Minute, smooth, oval galls the size of an entomological pin-head, occurring on the aments or blossoms; they are so small as to be easily mistaken for the ovaries.

Gall-fly.—Length .05 inch. Uniformly reddish brown, finely rugoso-punctate. Antennæ 13-jointed, they and legs pale yellowish brown. Abdomen reddish brown, smooth and shining, slightly dusky towards apex; wings hyaline, veins pale, radial area open, areolet indistinct, cubitus obsolete.

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This interesting little insect is described from several specimens bred in May, 1886.

27. **Dryophanta cinereæ** n. sp.—(The Upland-willow Oak Spangle Gall.)

Galls.—Small, semispherical galls, sessile on the under surface of the leaves; internally there is a loose kernel which moves freely about.

Gall-fly.—Length .07 inch. Differs from *Dryophanta palustris* O. S., *Dryophanta laurifoliæ* Ashm., and *Dryophanta aqaticæ* Ashm., only in its much smaller size. in having pale brown antennæ and the posterior coxæ black; while the color of the legs are pale yellow, there is a faint brownish blotch on basal third of posterior tibiæ not apparent in any of the other species.

Described from several specimens bred in May, 1886.

While the fly of this species might easily be confounded with those of the others, the gall easily separates it; it does not project above the upper surface of the leaf as do the other species. Very rare.

Galls on Water Oak (Quercus aquatica).

To the galls already described as occurring on this oak add the following:

28. **Callirhytis aquaticæ** n. sp.

Gall.—A hard knotty swelling at base of small twigs and branches, from .35 to .75 inch long by from .30 to .40 inch in diameter.

Gall-fly.—♀. Length .08 inch. Color entirely black, excepting tips of tibiæ, tarsi, and antennæ, which are somewhat reddish. Head and thorax finely rugoso-punctate, parapsidal grooves distinct, two short median grooves anteriorly and another short groove near the base of the wings. Abdomen polished, short, broader vertically than long, subglobose, truncate posteriorly; ventral valve short, obtuse. Wings hyaline, veins brownish.

Described from one specimen cut out of a gall in March.

Galls on Catesby's Oak (Quercus catesbæi).

29. **Andricus infuscatus** n. sp.

Gall.—A globular, fleshy gall, densely covered with yellow wool; diameter .23 to .25 inch. It is attached by a slight point to the upper surface of the leaf and when mature is in reality nothing but a hard, tough, larval cell, covered with wool; the wooly covering is easily detached. It is monothalamous; occasionally several galls occur together on the leaf compressing one another into odd shapes but the galls fall to the ground, separate and renew their globular form, and the fly reaches maturity in the damp earth. This gall has been known to me for several years, but until its habits were discovered my several efforts to rear the fly from it were unsuccessful.

Gall-fly.—♀. Length .10 inch. Color: head, thorax and legs brown. Antennæ towards tip and posterior tibiæ, infuscated; ocelli and eyes dark. Head and thorax finely confluently punctate; parapsidal grooves sharply defined. the two anterior median grooves extend to the middle of mesothorax, polished; an-

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tennæ 14-jointed, long, when extended backwards reaching to about the middle of abdomen, terminal joint longer than the preceding joint. Abdomen globose, slightly compressed, sheaths generally hidden. Wings hyaline, pubescent, veins brownish, marginal cell long and narrow, marginal nervure reaches the costal edge; areolet distinct; cubital cell nearly closed; cubital nervure reaches apical margin.

Described from several specimens reared in March.

30. **Andricus cryptus** n. sp.

Gall.—A small cocoon-like gall one-tenth of an inch in diameter, hidden in a branch under the bark and not visible externally. There is no appreciable swelling of the branch from this gall-fly, the fly escaping by cutting a hole from its larval cell through the bark; observing these holes in the bark led to its discovery.

Gall-fly. ♀. Length .12 inch. Color: head, antennæ, thorax and legs reddish brown; abdomen red. Antennæ 13-jointed, rather stout, joints narrowed at base; head and thorax confluently punctate, parapsidal grooves not sharply defined, but distinct; a distinct, but delicate median groove; scutellum subquadrate rounded posteriorly, depressed at base with two widely separated foveæ. Abdomen dilated below, as wide vertically as long, the second segment lengthened, surrounded at base by a woolly girdle, following segments short, but visible; sheaths not projecting. Wings glassy-hyaline, veins pale, with a slight yellowish tinge, marginal cell open along margin; areolet and cubitus obliterated.

Described from two specimens reared in May, 1886.

Galls on White Oak (Quercus alba).

31. **Dryophanta carolina** n. sp.

Gall.—A small, hard cellular, finely pubescent globular gall, .20 inch in diameter, slightly attached to the petiole of a leaf.

Gall-fly.—♀. Length .11 inch, robust. Color: head and abdomen brown, thorax black, antennæ and legs reddish brown. Antennæ 14-jointed, about as long as head and thorax combined; scutellum rugoso-punctate, pubescence long; abdomen as long as head and thorax together, sheaths projecting and with long hairs. Wings hyaline, pubescent, veins very distinct and thick, black, radial vein thickened, second transverse vein in a smoky cloud, areolet and cubital cell distinct, the latter closed, cubital nervure extends to apical margin

Described from two specimens reared in February from galls collected in Asheville, N. C., October, 1886.

Gall-flies captured at large, their galls unknown

32. **Dryophanta texana** n. sp.

♀.—Length .17 inch. Color: head and thorax black, antennæ, legs, including coxæ and abdomen brownish red, first two antennal joints brownish yellow. Antennæ 14-jointed, reaching to tip of scutellum; head finely punctate; ocelli large, prominent; thorax smooth, polished, with two parapsidal grooves, pleuræ and metathorax rugose, the disk of mesopleuræ smooth and polished; scutellum large rugoso-punctate, projecting over metathorax; wings hyaline, veins thick,

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distinct, black; the marginal nervure is greatly incrassated towards tip which does not reach costal margin. the second transverse vein in a smoky cloud; areolet and cubital cells distinct, the latter distinctly closed; there is also a smoky cloud at the break in the anal nervure and the thickened cubital nervure does not quite reach the apical margin.

Hab.—Texas. Described from one specimen, discovered among a lot of Texan Hemiptera, kindly sent me by Mr. Geo. J. Angell, of New York City.

33. **Aulax Harringtoni** n. sp.—♀. Length .11 inch. Head and thorax black, rugose, the sculpture being somewhat longitudinal. Antennæ 14-jointed, brown, reaching to the tip of the abdomen, joints 3, 4, 5 and 6 very nearly equal in length. The parapsides are distinct, and there is a slight median groove extending from base of scutellum not quite to middle of mesothorax; scutellum rounded with two sharply defined, oblique foveæ at base. The legs and abdomen slightly sanguineous; wings hyaline with distinct brown veins, a closed marginal cell, a rather large areolet and the cubital cell open at base.

Hab.—Canada. Described from one specimen sent by Mr. W. Hague Harrington, of Ottawa, Canada.

This is the first real *Aulax* to be described in our fauna, and like the European species of the genus it will no doubt be found to produce a gall on a plant belonging to the *Compositæ*.

BASSETTIA n. g.

The antennæ are very slender, 14-jointed, very slightly thickened toward tips, third joint slightly longer than fourth. Head as wide as the posterior part of mesothorax, punctate; cheeks full bulging. Thorax not high, one-third longer than wide, well rounded; mesothorax sharply transversely rugulose, extending and entirely hiding and covering the prothorax above; parapsidal grooves very delicate, subobsolete anteriorly and converging posteriorly; two short, delicate median grooves anteriorly, pleuræ rugulose; scutellum longer than broad, not elevated above a line with the mesothorax, rounded posteriorly, with a transverse groove at base and two small, oblique, shallow foveæ, only distinguishable with a high power lens. Metathorax abruptly declining. Abdomen longer than thorax, compressed, a tuft of hair at base of second segment. Wings hyaline, not pubescent; veins very slender, delicate; radial cell long, open.

In structure of thorax and sculpture this genus is related to *Rhoophilus* Mayr, otherwise it seems very distinct. It is dedicated to Mr. H. F. Bassett, of Waterbury, Conn., who has done so much towards advancing our knowledge of these intricate Hymenopters.

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34. **Bassettia floridana** n. sp.—♀. Length .13 inch. Black, head and thorax subopaque, abdomen shining, antennæ and legs brown, posterior femora and tibiæ dusky along dorsal surface. Wings hyaline.

Described from four specimens captured at large.

Mr. Bassett's *Cynips tenuicornis* will also belong to this genus.

EUMAYRIA n. g.

♂.—Antennæ long, filiform, 18-jointed; third joint very long, strongly curved, following joints short, gradually subequal, excepting the last joint, which is slightly longer than the preceding joint. Thoracic and wing characters as in the genus *Diastrophus*, excepting there is an indistinct median line of faint punctures on mesothorax; posterior margin of thorax straight, slightly ridged; mesopleuræ striate. Abdomen ovate, but slightly compressed beneath; the second segment occupies more than two-thirds its whole length; third segment short, following segments very short.

♀.—Antennæ much shorter than ♂, 14-jointed, gradually incrassated, the third joint is not especially long, not as long nor as thick as the first joint, about twice as long as fourth, others short, but gradually widened, the last joint being the largest and stoutest, more than twice as long as the preceding joint and shows evidences of being composed of three closely joined or connately joined joints. The abdomen is compressed, truncate posteriorly, ventral valve long, projecting; other characters as in the ♂.

This genus is a well marked one, and easily separated from all others in the family by the 18-jointed antennæ in the male and the other characters specified.

It is respectfully dedicated to Dr. Gustav Mayr, of Vienna, Austria, a *savant* of whom it is unnessary to speak. his labors in this family and in many others in the order *Hymenoptera*, etc., having justly entitled him to a world-wide fame.

35. **Eumayria floridana** n. sp.—♂ ♀. Length .11 to .13 inch. Color black, antennæ and legs red, coxæ black, tegulæ yellowish. Wings hyaline, pubescent, veins brownish, areolet small, cubital cell two-thirds closed, marginal cell open along the margin.

Described from five specimens taken at large in March, 1887.

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Galls on Wild Rose (Rosa carolina).

36. **Rhodites carolina** n. sp.—♀. Length .12 inch. Head, antennæ, excepting first two joints, and thorax, black; legs and abdomen red. Wings hyaline, marginal nervure very much thickened, veins, excepting submarginal vein at base, black.

Hab.—Asheville, N. C.

Differs principally from *Rhodites ignota* O. S., in having no clouds in marginal cell.

37. **Rhodites dichlocerus** Harris.

Two specimens of this gall were taken from the common wild rose in March, and numerous ♀ and ♂ flies were reared from them in April.

Galls on the Blackberry (Rubus villosus).

38. **Diastrophus nebulosus** Osten Sacken.
Diastrophus nebulosus O. S., Proc. Ent. Soc. Phil. vii, p. 36.

This gall is only occasionally found; it seems to be gradually disappearing from this part of the State.

39. **Diastrophus radicum** Bassett.
Diastrophus radicum Bass.

What I take to be this species has been twice found on the roots of the blackberry, in newly ploughed ground, but I am uncertain as to its identity, the flies not having been reared.

Galls on Wild Rose (Rosa lucida).

40. **Rhodites ignota** Osten Sacken.
Rhodites ignota O. S., Proc. Ent. Soc. Phil. vii, p. 42.

Along the banks of the St. John's River this gall is not uncommon on the rose; it takes a whole year to develop, and while hundreds of its guest-fly *Periclistis pirata* O. S., have been reared from it no specimens of the true originator of the gall have been obtained.

For the two rose galls not named by Baron Osten Sacken I propose the names *Rhodites carolina* and *R. spinosa;* specimens of the former were obtained by me this fall from *Rosa carolina*, at Asheville, N. C.

Galls on Huckleberry (Vaccinium corymbosum & V. pennsylvanicum).

I have obtained several specimens of this gall from *Vaccinium corymbosum*, but have bred but one fly. Mr. Wm. Brodie, of Toronto, Canada, sent me one specimen of a gall exactly like the ones ob-

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tained in Florida, and says it is common there on *Vaccinium pennsylvanicum.* He has had very little success at rearing the gall-maker, and reports having reared nothing from it but parasites.

The single ♀ specimen obtained by me is the type of a new genus.

SOLENOZOPHERIA n. g.

This genus is very similar to *Loxaulis* Mayr, and could only be confounded with that genus. It differs from it, principally, by having two faint, nearly parallel, narrow, parapsidal grooves, distinct posteriorly, subobsolete anteriorly; a more prominent, cushion-shaped, rugoso-punctate scutellum, without foveæ, but a slightly curved depression at base, similar to *Loxaulis;* the venation of wings as in *Loxaulis,* but the second longitudinal vein is very faint and there is no cubitus, although there is a very small areolet; the abdomen is short, much broader vertically than long, compressed; the ventral valve is rather prominent, but not so pointed as in *Aulax, Diastrophus* or *Rhodites,* it being squared off at a right angle; the second segment occupies about half the whole surface, the third segment hardly half as long as the second, fourth and fifth very short, others hidden.

41. **Solenozopheria vaccinii** n. sp.

Galls.—Irregular, reniform, pithy galls, from one-half to one inch or more long and seldom more than half an inch in diameter, although most frequently much less; on the stems.

Gall-fly.— ♀. Length .09 inch. Slender, pale yellowish brown, the surface is microscopically rugulose, but shining; ocelli and eyes brown; antennæ 13-jointed, very slightly, gradually thickened toward tips, with the terminal two-thirds infuscated; thorax with two narrow parapsidal grooves, much more distinct posteriorly than anteriorly; scutellum cushion-shaped with a curved depression at base, finely rugoso-punctate; tibiæ and posterior femora infuscated with a darker shade of brown on their upper edges; abdomen with the terminal segments brown; wings hyaline, pubescent, radial cell open, the cubitus obsolete, veins pale brown, the first transverse thick, stout, margined with a faint yellowish cloud, there is a slight yellowish cloud in the break in the second longitudinal vein and the areolet and base of radial cell all enclosed in the same colored cloud.

A very beautiful species, bred last of February, 1886.

I have drawn up the following tables of the genera of the *Eucoilinæ* and *Figitinæ,* recognized in our fauna, after much labor and research amidst the conflicting European authorities, and it is hoped with satisfactorily and permanent results:

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Subfamily EUCOILINÆ.

Scutellum cupuliform, abdomen obliquely truncate at tip.

Table of Genera.

Mesothorax polished without grooves.

Wings ciliate; antennæ ♀, 13-jointed, moniliform; ♂, 15-jointed, filiform.

♀ antennæ with three terminal joints enlarged; ♂ with third joint much shorter than fourth, fourth joint longest, following joints thrice as long as thick.....(2) **Kleidotoma** Westwood.

Marginal cell open, anterior wings emarginate at apex. (1) **Coptereucoila** n. g.

♀ antennæ with six terminal joints enlarged; ♂ with third joint longest, following joints twice as long as wide.....(3) **Hexaplasta** Föerster.

♀ antennæ with eight terminal joints enlarged; ♂ with third joint, narrowed at base, following joints thrice as long as wide, terminal joint lengthened.....(4) **Dimicrostrophis** n. g.

♂ antennæ 16-jointed, third joint shorter than fourth, following joints four times as long as wide (♀ unknown)...(5) **Macrocereucoila** n. g.

Wings not ciliate, pubescent.

Metapleuræ not hairy, second abdominal segment with a hairy girdle; ♀ antennæ gradually incrassated; ♂ with the third joint slightly shorter than fourth or about equal, following joints about thrice as long as wide.....(6) **Eucoila** Westwood.

Metapleuræ hairy; ♂ antennæ with third joint longer than fourth, following joints five times as long as wide .(7) **Glaurospidia** Thomson.

Wings entirely without pubescence; second abdominal segment without a hairy girdle.....(8) **Cothonaspis** Hartig.

Mesothorax polished with two parapsidal grooves.

♀ antennæ 13-jointed, ♂ 15-jointed, filiform, third joint twice as long as fourth and strongly curved and excised. ..... (9) **Eucoilidea** n. g.

Subfamily FIGITINÆ.

Table of Genera.

Scutellum smooth, polished, bifoveate, with a small erect club on its disk posteriorly; mesothorax smooth, polished, two distinct grooves; ♀ antennæ gradually incrassated, moniliform.....(1) **Thyreocera** n. g.

Scutellum smooth, polished, bifoveate, no erect club on its disk; mesothorax smooth with two grooves converging posteriorly, ♂ antennæ 14-jointed, third joint much longer than fourth, terminal joint longest. (2) **Omalaspis** Giraud.

Scutellum rugose, obtusely rounded at tip, or occasionally acute, but never prolonged into a long spine; abdominal petiole short, striate.

Mesothorax smooth with two grooves; ♀ antennæ 13-jointed, incrassated, moniliform; ♂ 14-jointed, filiform.

Eyes hairy; third antennal joint in ♂ much longer than fourth. (3) **Figites** Latreille.

Eyes not hairy; third antennal joint in ♂ not longer than fourth. (4) **Figitodes** n. g.

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Scutellum ending in a long spine, bifoveate.

Mesothorax smooth with two grooves; wings not pubescent, marginal cell closed; scutellum rugose, a median channel extending slightly up the spine; ♀ antennæ 13-jointed, incrassated, moniliform; ♂ 14-jointed, third joint much shorter than fourth, terminal joint longest.

(5) **Solenaspis** n. g.

Mesothorax scabrous, multicarinate; marginal cell open; eyes bordered interiorly with a carina; antennæ filiform in both sexes, ♂ 14-, ♀ 13-jointed.

(6) **Aspicera** Dahlbom.

Scutellum not ending in a spine.

Mesothorax scabrous, opaque, two grooves and a median carina; marginal cell open; scutellum large, truncate, channeled throughout; antennæ filiform in both sexes, ♂ 14-, ♀ 13-jointed.....(7) **Onychia** Haliday.

Scutellum cone shaped, not foveate.

Mesothorax scabrous, shining, two grooves, posterior margin straight, with a slight ridge; antennæ ♂ filiform, 14-jointed, joints connately joined; abdominal petiole very long, smooth; tips of abdomen rounded.

(8) **Acothyreus** n. g.

Scutellum subconical, bifoveate.

Mesothorax smooth, polished, two grooves, posterior margin straight, ridged; petiole of abdomen long, smooth, tip of abdomen pointed; antennæ in both sexes filiform, ♂ 14-, ♀ 13-jointed.....(9) **Anacharis** Dalman.

Scutellum truncate, elevated posteriorly, bifoveate.

Mesothorax uniformly punctate, two grooves; metapleuræ opaque; wing veins well developed, cubital, areolet and marginal cells, petiole of abdomen not especially long; abdomen clavate, slightly pubescent at base; antennæ filiform in both sexes, ♂ 14-jointed, third joint strongly excised, ♀ 13-jointed.....(10) **Amblynotus** Hartig.

Scutellum of ordinary form, bifoveate.

Mesothorax smooth, polished, two grooves; metapleuræ polished; wing veins well developed, cubital, areolet and marginal cells; abdomen cultriform or greatly compressed; second abdominal segment nearly of equal length with third; antennæ short, filiform in both sexes, ♂ 14-jointed, third joint not excised. ♀ 13-jointed.....(11) **Sarothrus** Hartig.

Mesothorax smooth, subopaque, sparsely pubescent, two very delicately defined grooves; metapleuræ hairy; abdomen compressed; antennæ short, filiform in both sexes, ♂ 14-jointed, third joint deeply excised, ♀ 13-jointed.

(12) **Melanips** Haliday.

Scutellum unifoveate.

♀ antennæ 13-jointed, incrassated, terminal joint very large.

(13) **Lonchidia** Thomson.

Subfamily Eucoilinæ.

COPTEREUCOILA n. g.

Closely related to the genus *Kleidotoma* Westwood, but easily separated from it by the open marginal cell and the emarginate anterior wings, as in the *Proctotrupid* genus *Coptera* Say.

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42. **Coptereucoila americana** n. sp.—♀. Length .04 inch. Black polished, legs and antennæ red. Wings hyaline, ciliate, veins dark, marginal cell open.

Described from two specimens.

KLEIDOTOMA Westwood.

43. **Kleidotoma americana** n. sp.—♀. Length .10 inch. Black, highly polished. Head smooth, with a few scattered lines and punctures; antennæ 13-jointed, rufous, slightly pubescent, the first joint stout, long, obconical, as long as second and third combined, second oval, stouter than third, third slightly longer than second narrowed at base, fourth to tenth very short, small; eleventh, twelfth and thirteenth joints greatly enlarged, nearly four times as large as any of the others, the terminal one being slightly the largest. Thorax polished without grooves, the visible outer angles of prothorax reddish; scutellum with a small pale brownish cup on disk and deeply foveated at base. Legs pale yellowish brown; abdomen elongate ovate, slightly compressed and somewhat acuminate, black and shining. Wings hyaline, pubescent, ciliate, marginal cell small, triangular, closed; no other cells.

Hab.—Canada (Abbe Provancher).

HEXAPLASTA Föerster.

44. **Hexaplasta maculipes** n. sp.—♀. Length .09 inch. Black, polished. Legs dark red with a dark blotch on all the femora above; antennæ dark red, with the six enlarged terminal joints dusky; abdomen much longer than head and thorax combined. Wings hyaline, veins reddish, excepting the closing marginal vein, which is pale.

Described from one specimen taken in March.

This species is about twice as large as *Hexaplasta zigzog* Riley, and cannot be confounded with it.

DIMICROSTROPHIS n. g.

This genus differs from *Eucoila* West., and *Hexaplasta* Föerst., in having the fourth and fifth antennal joints in ♀ very small, the six about as long as third, but stouter, and joints seventh to thirteenth enlarged, moniliform, slightly peduncled and striate. The wings are ciliate, and the pubescent abdominal girdle is nearly obsolete. In the male the third joint of antennæ is longest, narrowed at base, and the following joints are about thrice as long as wide, the terminal joints being a little longer than the preceding one.

45. **Dimicrostrophis ruficornis** Ashm. (Prov. Add. Faun. Hym. 173) —♀. Length .08 inch. Black, smooth and highly polished. Antennæ 13-jointed, pubescent, dark red, first joint stout, obconic; second small, globular; third not quite twice as long as second, much more slender and narrowed at base, fourth and fifth joints very small, hardly half the length of third, following

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enlarged, moniliform. Thorax smooth, without grooves, not compressed at sides and elevated as in *Eucoila*. Scutellum not greatly elevated, cupuliform, black; pleuræ smooth, polished; metathorax pubescent; legs yellowish, contrasting greatly with the red antennæ. Abdomen ovate, compressed, polished, black. Wings hyaline, pubescent, ciliate, marginal cell closed.

Hab.—Cap Rouge, Canada (Abbe Provancher).

46. **Dimicrostrophis xystiformis** n. sp.—♂. Length .04 inch. Black, polished. Antennæ dark ted, legs paler red. Antennæ 15-jointed, filiform, much longer than body, third joint slightly longer than others and slightly bent, following about thrice as long as wide, last joint slightly lengthened; cup of scutellum very small; pleuræ smooth, polished. Legs: femora obfuscated above near base. Abdomen black. Wings hyaline, pubescent and ciliate, marginal cell triangular.

Hab.—Florida.

MACROCEREUCOILA n. g.

This genus is founded on the male alone, the female still being unknown, but is easily recognized by its long *sixteen-jointed antennæ*, about twice as long as the whole insect; the third joint is much shorter than fourth, while the following joints are four times or more than four times as long as wide; the scutellar cup is very high, deeply excavated, with the margins sharp and slightly deflexed. The apical tibial spur on anterior legs is very long, curved, and there is a distinct cubital nervure extending from the obsolete areolet to near the apical margin of wing; meso- and metapleuræ smooth, polished.

No ♂ *parasitic* cynips has been described with more than 14–15-jointed antennæ, and while not uncommon among the gall-making cynips, the 16-jointed antennæ makes the following species a unique among the *Figites:*

47. **Macrocereucoila longicornis** n. sp.—♂. Length .10 inch. Black, polished; the sixteen-jointed antennæ and legs including coxæ, red. Wings hyaline, pubescent, veins reddish, radial area large, closed; cubital cell partly closed, no areolet.

EUCOILA Westwood.

48. **Eucoila rubripes** n. sp.—♂. Length .10 inch. Similar to the above but with only fifteen joints in the antenne and the wing veins not reddish but pale, and the cubital nervure is not at all developed.

Described from two specimens.

COTHONASPIS Hartig.

In this genus should be placed *Kleidotoma vagabunda* Ashm.

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EUCOILIDEA n. g.

This genus is at once distinguished from all other genera in the *Eucoilinæ* by two parapsidal grooves on mesothorax, which converge and meet at about two-thirds their length posteriorly, thence to base of the scutellum as a delicate carina.

The cup of scutellum is very large, elliptical, greatly elevated above a line with the mesothorax, and separated from it by a transverse arcuate groove; its upper surface flat, but slightly pressed in on the disk. Wings as in *Eucoila*. The antennæ in ♂ is 15-jointed and very distinct from all others in the genera of the *Eucoilinæ* in that the third joint is twice as long as the fourth, strongly curved and excised, the following joints are about equal in length, a little more than twice as long as wide or long moniliform, the terminal joint being slightly smaller than the preceding one. Abdomen as in *Eucoila*, but annulus at base without pubescence. Two species in our fauna has been discovered as follows:

49. **Eucoilidea longicornis** n. sp.—♂. Length .07 inch. Black, polished; antennæ red, longer than body; legs, excepting femora at tips, honey-yellow, femora black; wings hyaline, pubescent; veins pale.

Described from one specimen captured at large.

50. **Eucoilidea canadensis** n. sp.—♀. Length .09 inch. Differs from *longicornis* principally in having all the legs dark red and the veins in the wings yellowish.

Hab.—Canada (Abbe Provancher).

Subfamily FIGITINÆ.

THYREOCERA n. g.

This genus is allied to *Figites* and *Eucoila*, and is founded upon one ♀ specimen. The antennæ are 13-jointed as in *Figites* and *Eucoila;* the thorax smooth, with two parapsidal grooves; the scutellum differs from those of other genera in being smooth, polished and having *a small erect club on its disk posteriorly near the tip*, bifoveate at base. The abdomen is compressed, somewhat similar to *Melanips* Haliday, in shape, all the segments being visible, but differs in that the third joint is much longer than the second and is not ornate at base, without either a pubescent girdle or a striate annulus; the petiole is short, stout, striate. The wings have a long, triangular, closed marginal cell, and the marginal nervure and second transverse cross each other, forming a triangular areolet.

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This genus seems to form a connecting link between *Figites* and *Eucoila*, the erect club on the posterior part of its scutellum, which easily separates it from all other genera, being evidently analogous to the cup in *Eucoila*.

51. **Thyreocera nigrifemora** n. sp.—♀. Length .10 inch. Black, smooth and polished, very slightly pubescent; antennæ and legs dull honey-yellow, two basal joints in antennæ and femora, excepting tips, black. Abdomen ovate, compressed, somewhat pointed, ventral valve projects slightly beyond the upper terminal segment and the ovipositor is slightly exserted. Wings hyaline, pubescent; veins brown.

Hab.—Canada (Abbe Provancher). Described from one specimen.

OMALASPIS Giraud.

52. **Omalaspis floridanus** n. sp.—♂. Length .12 inch. Head nearly smooth, a pit at the base of each antenna; antennæ red, 14-jointed, filiform; joints long oval, first joint stout, black, polished, second round, third slightly longer than fourth, excised slightly, exteriorly; terminal joint the longest joint. Mesothorax polished, with two grooves; prothorax striate at sides, pleuræ smooth, the mesopleuræ faintly longitudinally striate, scutellum smooth, elongate, truncate posteriorly, bifoveate at base, there is a slight groove at lateral margins; legs red. Abdomen ovate, slightly compressed, petiole very short, striate. Wings hyaline; veins yellowish.

Described from two specimens captured at large.

FIGITES Latreille.

53. **Figites floridanus** n. sp.—♀. Length .15 inch. Black and shining, with some sparse pubescence on head and thorax. Head rugoso-punctate, subopaque: eyes oval, sparsely pubescent; antennæ red, basal joint black, polished, longest, clavate, second small, globular, third about one-third longer than fourth, from fifth joint moniliform. Thorax above smooth, polished, with two distinct grooves; prothorax and pleuræ striate; scutellum rugose with two large, deep foveæ, tip obtuse. Legs honey-yellow all coxæ black, femora above in middle, more or less obfuscated. Abdomen long ovate, compressed, pointed at tip, and a striate annulus at base; petiole short, stout; second abdominal segment striate at base, third occupying nearly all the rest of the abdomen; the ovipositor is exserted, and the ventral valve extends a little in advance of the last dorsal segment. Wings hyaline; veins pale brown.

SOLENASPIS n. g.

The full characters of this genus given in the "Table of Genera" will easily distinguish it.

54. **Solenaspis hyalinipennis** n. sp.—♀. Length .13 inch. Black, polished. Head rugose, striate in front; antennæ and legs red. Thorax smooth, with two grooves, a short deep groove or an elongate fovea at posterior margin between the parapsidal grooves; prothorax coarsely striate; mesopleuræ very

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finely striate; scutellum with two deep foveæ at base, separated only by a slight carina, a deep median groove extends from them and slightly up the spine. Wings hyaline, free from pubescence, the veins so delicate and pale as to be only visible when seen through transmitted light, the anterior wings are broad and the marginal cell is broad.

Described from one specimen taken at large.

ASPICERA Dahlbom.

55. **Aspicera albihirta** n. sp.—♀. Length .14 inch. Black, scabrous, shining. Head rugose or carinated, a prominent carina extends from base of each antennæ, along the anterior orbits of eyes: ocelli prominent, with a depression or fovea behind and then transversely carinated; a depression at base of antennæ: the face and cheeks covered with dense white pile; antennæ short, 13-jointed, filiform, brownish yellow; first two joints black, others elongate, third slightly shorter than fourth, about equal with fifth, others subequal, the terminal one being very long and the longest joint. Thorax transversely rugose and carinated, parapsides distinct, converging behind, bordered by a carina, a median carina between separated by two carina before reaching base of scutellum, thence as a deep groove; anteriorly there are two short, oblique carina, ending abruptly before reaching the middle carina; a deep longitudinal groove at base of wings; prothorax large, hind margin emarginate with two oblique carina of the mesothorax, sides hairy, mesopleuræ alone being smooth and polished; scutellum large, quadrate, ending in a long spine, two deep approximate foveæ at base, separated by a narrow carina, the surface reticulately rugose; metathorax covered with dense white pile. Legs brownish yellow, tibiæ sparsely pubescent, posterior tibiæ longitudinally carinate on inner side, the basal joint of posterior tarsi is cylindrical, stout, as long as all the others combined. Abdomen ovate, black, polished, but only slightly compressed, with a striate girdle at base. Wings hyaline, veins pale, slightly yellowish, the marginal cell open, the submarginal and marginal vein not being prolonged to the marginal edge.

Described from one specimen taken while in the act of depositing an egg in a dipterous gall.

56. **Aspicera similis** n. sp.—♀. Length .10 inch. Sculptured as in *Aspicera albihirta*, but differs as follows: size much smaller, antennæ and legs of a more decided yellow, first two antennal joints not black, third joint is as long as fourth, the terminal joint being two and a half times longer than the preceding joint and brownish; the pubescence while similar is not so dense; the thorax is smooth, for while the sculpture is very much the same it is not so transversely rugulose; the scutellum, too, while ending in a long spine is not reticulately rugose or carinated, there being three longitudinal carina, a central one extending up the spine, and two lateral ones; finally, the veins in the wings are so pale as to be hardly perceptible.

Described from two specimens captured at large.

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ONYCHIA Haliday.

This genus is the same as *Callaspidia* Dahlbom.

57. **Onychia Provancheri** Ashm. (Callaspidia, Prov. Add. Faun. Hym. 167)—♀. Length .18 inch. Head and thorax black, opaque, transversely rugulose. Head with very coarse, transverse rugosities, covered with a whitish pubescence on face, cheeks and surrounding mouth parts; a pit in front of each lateral ocelli; eyes long oval, brown; antennæ 13-jointed, filiform, rufous; third and terminal joints longest, about equal in length, first obconic, second globular, both black, the third at base is also more or less black; thorax transversely rugoso-punctate, parapsidal grooves distinct, with a median carina; prothorax appearing as a carina at sides, scutellum rufous, very large, elevated posteriorly and extending slightly over the metathorax with two broad, deep, longitudinal channels its whole length, the bottom of which are covered with transverse rugosities; metathorax at sides and coxæ pubescent. Legs rufous, femora along upper edges obfuscated; the posterior tibiæ have two apical spines, a broad longitudinal groove beneath and one not so broad above; the basal tarsal joint is cylindrical and as long as all the others combined. Wings hyaline, with an open marginal cell.

Hab.—Cap Rouge, Canada.

This species was sent to me by Abbe Provancher, in honor of whom I take pleasure in dedicating the species.

It seems very closely retated to the European *Onychia* (Callaspidia) *Dufouri* Giraud, but I cannot but think it a distinct species.

ACOTHYREUS n. g.

This genus is founded upon one ♂ specimen captured at large some years ago. It is closely related to *Anacharis* Dalman, by its long petiolated abdomen, but easily separated by its much higher cone-shaped, rugose, non-foveate scutellum and a gradually declining rugose metathorax; the antennæ are long, the joints closely connately united, 14-jointed; the mesopleuræ are polished, divided by a longitudinal groove; the abdomen is ovate, not compressed and obtusely rounded at apex, in *Anacharis* it is pointed; the petiole is very long and smooth; the marginal cell is closed triangular, the areolet a callous dot; no other cells.

The thorax, head and antennæ in this genus resembles *Amblynotus* somewhat, but the long petiole of abdomen and venation of wings easily separate it.

58. **Acothyreus osceola** n. sp.—♂.—Length .13 inch. Black, shining; antennæ and legs yellowish. Head subquadrate, finely punctate; occiput smooth, face rather densely covered with whitish pubescence, ocelli prominent, almost on a straight line, the front one being but slightly in advance of the others; antennæ 14-jointed, very long, first joint black; thorax irregularly rugose above

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and at sides two distinct parapsidal grooves; mesopleuræ smooth, polished; scutellum conic, very rugose; metathorax scabrous. Abdomen ovate, not compressed nor ornate, the petiole very long, slender, smooth; the second and third abdominal segments are about equal. Legs yellowish, all coxæ black. Wings hyaline, veins brownish, the marginal cell large, closed, the marginal vein being straight and stouter towards apex.

Described from one specimen captured at large.

ANACHARIS Dalman.

59. **Anacharis melanoneura** n. sp.—♂. Length .10 inch. Stature of *Anacharis eucharoides* Dalm. Black, shining; antennæ 14-jointed, brownish yellow, first two joints black. Legs brownish yellow, coxæ black, femora with a dusky streak or blotch above. Wings hyaline, veins yellowish, the costal and marginal vein black.

Described from one specimen taken in March.

MELANIPS Haliday.

60. **Melanips Iowensis** n. sp.—♀. Length .10 inch. Black, shining. Head as broad as thorax, microscopically punctate: antennæ 13 jointed, filiform, reaching to tip of mesothorax, dull yellowish brown, first two joints black, terminal joint dark; thorax with surface finely punctate, subopaque, parapsidal grooves very delicate; mesopleuræ smooth, polished; scutellum finely rugose; metathorax pubescent. Legs brownish yellow, femora and tibiæ obfuscated, coxæ black. Abdomen slightly longer than head and thorax combined, compressed, ovate, smooth, black and shining, a hairy girdle at base, all segments visible, second and third nearly equal, others short, slightly subequal, excepting the seventh, which is prolonged, triangular. Wings hyaline, marginal cell large, triangular.

♂. Length .06 inch. Head and thorax smoother than in ♀, antennæ 14-jointed, paler than in ♀, the three terminal joints dusky. Abdomen short, oval, not compressed, and not as long as thorax; otherwise as in the female.

Hab.—Keota, Iowa. Described from five specimens (2♂, 3♀) kindly sent me by Mr. A. S. Van Winkle.

LONCHIDIA Thomson.

L. Abbe Provancher, in "Le Naturaliste Canadien" has recently described a species in this genus, *Lonchidia hirta*, which should have been credited to us, the species having been identified for him under that name, while MS of same was in the hands of the American Entomological Society. We have, consequently, been compelled to suppress our description.

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Monograph of the species belonging to the genus ANTHRAX from America north of Mexico.

BY D. W. COQUILLETT,
Los Angeles, Cala.

The genus *Anthrax* Scop., is easily distinguished from the allied genera by the following characters:

Second vein issues from the third opposite or nearly opposite the small crossvein, the distance being never more than the length of that crossvein; usually two, rarely three submarginal cells, four posterior cells (five in *halcyon*); anal cell not widest at its apex; antennal style minute or wanting; pulvilli wanting.

In the "Canadian Entomologist," for 1886, page 157, I have given my reasons for uniting the genus *Dipalta* O. S. to *Anthrax;* in the present paper I retain it in the sense of a subgenus for those species which always have three submarginal cells.

In the following pages I have placed an exclamation point (!) after those localities from which I have obtained specimens of the different species, and I have placed a similar mark after those synonymies made out by myself; the other localities and synonyms are those given in Osten Sacken's excellent "Catalogue of the described Diptera of N. America."

In this place I desire to express my sincere thanks to the following persons who have aided me in the preparation of this paper: Dr. S. W. Williston, Dr. H. A. Hagen, Mr. B. Pickman Mann, Mr. E. L. Keen and others.

Anthrax curta Loew, and *A. pertusa* Loew, are unknown to me. I submitted specimens of several species to Dr. Hagen for comparison with Loew's types, and he wrote me that Loew's *diagonalis* differs from Say's *edititia*, and also from my *perplexa*. My determination of *bigradata* Loew, Dr. Hagen writes me is correct, but this species differs decidedly from *curta* Loew, and *sagata* Loew, as does also my *scitula; flaviceps* Loew differs from my *Willistonii*, and *pertusa* Loew, although resembling my *nugator*, is a different species.

Anthrax sinuosa Wied., is best located in the genus *Hemipenthes* Loew, as it is furnished with pulvilli.

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Table of Genera.

1.—Wings with a crossvein between second vein and anterior branch of the third. .....2.
Wings destitute of such a crossvein (present in rare instances).. ....4.
2.—Wings distinctly hyaline and brown; abdomen with black pile or tomentum.....3.
Wings pale yellowish, the apex hyaline; pile and tomentum of abdomen wholly yellowish .....1. **junctura.**
3.—Greater portion of anal and axillary cells hyaline; the hyaline band crossing discal cell extends to marginal cell.....2. **serpentina.**
Greater portion of anal and axillary cells brown; the hyaline crossband extends only to first posterior cell.....3. **Keenii.**
4.—Anal cell wholly pure hyaline; wings hyaline, sometimes with darker spots; scutellum wholly black, except in *adumbrata*.....5.
Anal cell never wholly pure hyaline; wings largely or wholly brown....25.
5.—Wings wholly pure hyaline, except sometimes the costal and first basal cells.....6.
Wings with brown spots (especially on crossveins), or else base of wings largely tinged with smoky..... ..14.
6.—Sides of abdomen abundant pilose.....7.
Sides of abdomen very sparse pilose, epistoma considerably produced, pile on front part of breast black; length 6-7 mm.....12. **turbata.**
7.—Sides of third abdominal segment with black pile.....8.
Sides of third abdominal segment destitute of black pile.....11.
8.—Abdomen destitute of bronze-colored tomentum..... 10.
Abdomen with bronze-colored tomentum.....9.
9.—Fourth abdominal segment wholly bronze-colored tomentose, front tibiæ destitute of bristles.....5. **nebulo.**
Fourth abdominal segment destitute of bronze-colored tomentum, front tibiæ provided with bristles.....4. **senea.**
10.—Fifth and sixth abdominal segments with deep reddish-brown tomentum. 6. **consessor.**
Fifth and sixth abdominal segments destitute of reddish-brown tomentum. 7. **alternata.**
11.—Abdomen with crossbands of yellowish tomentum, or else wholly and densely whitish or yellowish tomentose.....12.
Abdomen destitute of crossbands of yellowish tomentum, never wholly whitish or yellowish tomentose, the sides destitute of black pile. 9. **fulviana.**
12.—Face and first two antennal joints black, first antennal joint subglobular at its base, claws of front tarsi small..... 13.
Face and first two antennal joints reddish, third antennal joint elongate-conical at its base, claws of front tarsi well developed...8. **mercedis.**
13.—Apex of male abdomen silvery tomentose, breast destitute of black pile, black bristles on front edge of antecostal cell very sparse..10. **mucorea.**
Apex of male abdomen destitute of silvery tomentum, black bristles on front edge of antecostal cell abundant..... .....11. **molitor.**
14.—Wings with brown spot in marginal cell above base of second submarginal cell, and one in middle of first posterior cell.....13. **proboscidea.**
Wings destitute of these spots.....15.

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15.—Scutellum wholly black .....16.
Scutellum partly or wholly reddish, front tibiæ destitute of bristles, claws of front tarsi minute .....34. **adumbrata.**
16.—Tomentum of occiput white .....17.
Tomentum of occiput wholly yellowish .....22.
17.—Proboscis projects one-fourth its length or more beyond the epistoma.....18.
Proboscis does not project beyond the epistoma .....20.
18.—First two antennal joints yellowish, the third subglobular at its base; front tibiæ provided with bristles .....19.
First two antennal joints black, the third conical at its base; front tibiæ destitute of bristles .....18. **caprea.**
19.—Base of marginal cell hyaline, fourth abdominal segment in the male shining tomentose .....21. **agrestis.**
Base of marginal cell brown, fourth abdominal segment in both sexes destitute of shining tomentum .....20. **lauta.**
20.—Tomentum of venter partly or wholly white or yellowish, claws of front tarsi small .....21.
Tomentum of venter wholly black, claws of front tarsi large, legs black. 14. **anna.**
21.—Legs reddish, tomentum of apical half of venter yellowish, abdomen destitute of black tomentum, brown clouds on veins at bases of third and fourth posterior cells .....17. **eudora.**
Legs black, tomentum of apical half of venter black, apices of third and fourth abdominal segments black tomentose, no brown clouds, etc. 15. **supina.**
22.—Base of fourth abdominal segments destitute of a crossband of black tomentum .....23.
Base of front abdominal segment with a crossband of black tomentum, venter and breast yellowish tomentose and pilose....22. **campestris.**
23.—Venter and breast yellowish tomentose and pilose, abdomen destitute of black tomentum .....24.
Venter and breast wholly black tomentose and pilose, abdomen with black tomentum .....16. **inops.**
24.—Base of third antennal joint subglobular; length of body 4-8 mm. 19. **inauratus.**
Base of third antennal joint elongate-conical; length of body 9-12 mm. 33. **edititia.**
25.—Pile and tomentum of head and abdomen partly white or yellowish.....26.
Pile and tomentum of head and abdomen wholly black, base of wing to tip of discal cell blackish, the apex hyaline .....23. **atrata.**
26.—Scutellum partly or wholly reddish .....27.
Scutellum wholly black .....38.
27.—Apex of wings beyond base of second submarginal cell distinctly hyaline and brown .....28.
Apex of wings beyond base of second submarginal cell either wholly hyaline, wholly gray or wholly brown .....31.
28.—Third posterior cell divided by a crossvein into two cells, a stump of a vein projects into the second cell from the great crossvein. 50. **halcyon.**
Third posterior cell never divided into two cells .....29.

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29.—Posterior edge of axillary cell broadly bordered with brown.. ....30.
Posterior edge of axillary cell largely hyaline.....49. **Williston ii.**
30.—Pile of sides of abdomen prevailingly yellowish, first antennal joint yellowish, brown of wings with a yellowish tinge.....48. **alpha.**
Pile of sides of abdomen prevailing black, first antennal joint black, brown of wings with a blackish tinge.....51. **ceyx.**
31.—Veins at bases of first and fourth posterior cells bordered with subhyaline..32.
Veins at bases of first and fourth posterior cells never bordered with subhyaline.....34.
32.—Base of third antennal joint elongate-conical, extreme base of discal cell hyaline.....33.
Base of third antennal joint subglobular, extreme base of discal cell brown. 42. **parvicornis.**
33.—Sides of third abdominal segment with black pile, brown of wings encloses a hyaline spot at base of second submarginal cell.....44. **pertusa.**
Sides of third abdominal segment destitute of black pile, brown of wings does not enclose, etc.....43. **nugator.**
34.—Apex of wings wholly brown, but little lighter than the basal part.....35.
Apex of wings pure hyaline or grayish, noticeably lighter than the basal part.....36.
35.—Posterior margins of abdominal segment black tomentose, legs largely black. 47. **lucifer.**
Posterior margins of abdominal segments destitute of black tomentum, legs reddish.....46. **tegminipennis.**
36.—Venter partly or wholly reddish.....37.
Venter wholly black, front tibiæ destitute of bristles, pile of sides of abdomen prevailingly whitish .....46. var. **Sackenii.**
37.—Epistoma much produced, front tibiæ destitute of bristles. 48. var. **fuliginosa.**
Epistoma retreating, front tibiæ provided with bristles.....24. **miscella.**
38.—Apex of discal cell pure hyaline, vein at its apex alone rarely bordered with brown.....39.
Apex of discal cell (especially along the veins) brown .....52.
39.—Epistoma but little or not at all produced, first two antennal joints of nearly an equal length, base of the third subglobular or short conical.....40.
Epistoma much produced, first antennal joint usually about twice as long as the second, base of the third elongate-conical.....45.
40.—Tomentum of occiput white.....42.
Tomentum of occiput yellowish, no cloud on veins at base of second submarginal and second posterior cells.....41.
41.—Second and third abdominal segments wholly black tomentose, front tibiæ destitute of bristles, claws of front tarsi minute.. .....30. **bigradata.**
Second and third abdominal segments largely yellowish tomentose, front tibiæ provided with bristles, claws of front tarsi well developed. 41. **plagosa.**
42.—Wings destitute of a brown cloud on veins at bases of second submarginal and second posterior cells, claws of front tarsi small .....43.
Wings with a brown cloud on veins at bases of second submarginal and second posterior cells, claws of front tarsi large. ....32. **cautor.**
43.—Outline of brown of wings irregular and curved, apex of axillary cell hyaline .....44.

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Outline of brown of wings nearly straight, axillary cell wholly brown. 28. **celer.**

44.—Third abdominal segment with a crossband of white tomentum, thorax and scutellum coppery tomentose .....26. **scitula.**

Third abdominal segment destitute of white tomentum, thorax and scutellum destitute of coppery tomentum.....25. **curta.**

45.—Legs reddish, tomentum of abdomen largely reddish..... 46.

Legs black, tomentum of abdomen black and yellowish..... 40. **dispar.**

46.—Abdomen broadly reddish on the sides, front tibiæ destitute of bristles...47.

Abdomen (except sometimes the apex) wholly black, front tibiæ pointed with bristles.....48.

47.—Base of wings brownish-black, wings destitute of darker spots. 31. **fulvohirta.**

Base of wings brownish-yellow, wings with five or six darker spots. 39. **impiger.**

48.—Base of discal cell to small crossvein wholly brown, brown in anal cell extends beyond base of fourth posterior cell, antennæ wholly black. 36. **perplexa.**

Base of discal cell to small crossvein never wholly brown, first antennal joint reddish.....49.

49.—Front coxæ and sides of abdomen with numerous black pile.....50.

Front coxæ and sides of abdomen destitute of black pile.....51.

50.—Pleura destitute of black pile, occiput white tomentose, a white tomentose vitta on each side of dorsum of thorax.....29. **syrtis.**

Pleura largely black pilose, occiput yellowish tomentose, dorsum of thorax destitute of a white tomentose vitta each side.....35. **palliata.**

51.—Pile of abdomen yellowish or reddish.....33. **edititia.**

Pile of abdomen white.....37. **vigilans.**

52.—Sides of abdomen broadly reddish, second vein strongly curved 5-shaped towards its apex, front tibiæ destitute of bristles.....45. **mira.**

Sides of abdomen black, second vein not curved 5-shaped toward its apex, front tibiæ usually provided with bristles.....53.

53.—Bristles of thorax and scutellum yellowish, legs reddish.....54.

Bristles of thorax and scutellum black, legs black.....27. **vana.**

54.—Pile and tomentum of abdomen white..... 37. **vigilans.**

Pile and tomentum of abdomen yellowish.....38. **fumida.**

Descriptions of Species.

1. **Anthrax** (**Dipalta**) **junctura** n. sp.—Front black, reddish below, pale yellowish tomentose and pilose; face yellowish, much produced below, pale yellowish tomentose; proboscis projects one-third its length or less beyond epistoma; first two joints of antennæ yellow, the third black or obscure reddish, short conical at its base; occiput pale yellowish tomentose. Thorax black, pale yellowish tomentose and pilose; bristles of hind angles yellowish; pleuræ pale yellowish pilose; scutellum black, the apex sometimes reddish, its tomentum, pile and bristles pale yellowish. Abdomen black, hind margin of each segment narrowly and the sides sometimes broadly reddish; tomentum and pile of abdomen wholly pale yellowish; venter black and reddish, pale yellowish tomen-

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tose. Legs yellowish, pale yellowish tomentose, front tibiæ destitute of bristles, tarsi toward the apex black, claws of front tarsi small. Wings pale smoky brown, with a yellowish tinge, the apex more hyaline; first submarginal cell divided by a crossvein into two cells. Length 9–10 mm.

California. Thirteen specimens in May.

2. **Anthrax (Dipalta) serpentina** O. S. (Syn. *Dipalta serpentina* O. S.) —Black, tips of femora, tibiæ wholly and sometimes first joint of antennæ, reddish. Front and face reddish tomentose and black pilose, epistoma considerably produced; proboscis projecting length of labellæ or less beyond epistoma; third joint of antennæ short conical at its base; occiput yellowish tomentose. Thorax reddish tomentose, pile of sides and front end yellowish, bristles of hind angles reddish; pleuræ yellowish pilose; scutellum reddish tomentose, bristles also reddish. Abdomen reddish tomentose, that on middle of second, third and fourth segments black, most extended on the fourth segment: pile on sides of first three segments quite abundant, yellowish mixed with a few black ones, that on sides of remaining segments sparse, depressed and chiefly black; dorsum of abdomen with numerous black pile posteriorly; venter yellowish tomentose. Legs yellowish tomentose, front tibiæ destitute of bristles, claws of front tarsi small. Wings hyaline, costal cell yellowish, a brown spot in base of each basal and of the anal and axillary cells, a brown crossband, narrowest posteriorly, extends from costal cell to hind margin of wing, filling bases of first submarginal, first, third and fourth posterior cells and of the discal cell, also the apex of each basal and of the axillary cell, inclosing a hyaline spot in base of marginal cell; a second brown crossband extends from costal cell to hind margin of wing, filling apices of first submarginal, first posterior and discal cells, and bases of second and third submarginal and second posterior cells; a brown spot on apex of second vein, another near apex of anterior branch of third vein, a third on apex of anterior intercalary vein, and a fourth on apex of fifth vein, but the last two spots are sometimes jointed to the second brown crossband; first submarginal cell divided by a crossvein into two cells, second vein strongly S-shaped before its tip; a stump of a vein projects into marginal cell from second vein at or near upper end of crossvein at apex of first submarginal cell. Length 9–11 mm.

Florida!, Georgia, Colorado, California, Mexico. A single specimen (Morrison).

3. **Anthrax (Dipalta) Keenii** n. sp.—Front brownish, the crown black, golden-yellow tomentose and black pilose; face obscure reddish, retreating below, golden-yellow tomentose and black pilose; proboscis projecting about one-half its length beyond epistona; antennæ black, the third joint subglobular at its base, the styliform portion linear, slender, and longer than rest of antenna; occiput golden-yellow tomentose. Thorax black, coppery tomentose, the sides and front end reddish pilose, bristles of hind angles coppery; pleura reddish pilose, a cluster of pale yellowish pile beneath root of each wing; scutellum black, its tomentum and bristles coppery. Abdomen black, reddish or coppery tomentose, the sides reddish pilose, a cluster of black pile in hind angles of segments from two to six; venter black, coppery tomentose. Legs brownish, golden-yellow tomentose and black pilose, front tibiæ provided with bristles; tarsi toward the apex black, claws of front tarsi well developed. Wings blackish brown, the following parts hyaline; a conical spot in outer end of axillary and anal cells; a larger

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one in discal cell just beyond small crossvein, extending across the third and fourth posterior cells, extreme apex of third posterior, apex of second and first posterior, of the third submarginal and sometimes also of the second submarginal cell; a spot in outer end of marginal cell extending into the second submarginal cell, and sometimes united with the hyaline at apex of wing; a spot in last third of first submarginal cell; a small spot in apex of second basal cell, and sometimes one in centre of second submarginal cell; a subhyaline spot in first basal and base of marginal cell; first submarginal cell divided by a crossvein into two cells. Length 10 mm.

Arizona! Four specimens (Williston, Keen).

I take great pleasure in naming this interesting species in honor of my young friend, Mr. Eugene L. Keen, of Philadelphia, Pa., who has aided me much in my studies of this difficult group.

4. **Anthrax ænea** n. sp.—Wholly black. Front whitish tomentose and black pilose; face much retreating below, white tomentose; proboscis not projecting beyond epistoma; first two joints of antennæ of an equal length, third joint subglobular at its base, the styliform portion slender and linear; occiput white tomentose. Thorax bronze-colored tomentose, the sides and front end whitish pilose, the dorsum black pilose, bristles of hind angles black; pleura white pilose; scutellum bronze-colored tomentose, bristles black. Abdomen black tomentose, a white tomentose crossband on bases of second and fourth segments and a crossband of bronze-colored tomentum on bases of third, fifth and following segments, occupying nearly whole dorsum of last three segments; sometimes a similar crossband on second segment; sides of abdomen quite abundant pilose, that on sides of the first segment, basal half of second and fourth, and sides of last two segments white, on sides of rest of abdomen black; last segment in the male destitute of silvery-white tomentum; venter white tomentose, a crossband of black tomentum on bases of third, fifth, sixth and seventh segments. Legs yellowish or black tomentose, front tibiæ provided with bristles, claws of front tarsi minute. Wings hyaline, costal cell yellowish; antecostal cell wholly black tomentose. Length 7–8 mm.

California. Nine specimens.

5. **Anthrax nebulo** n. sp.—Same as *ænea* except: Legs yellowish; tomentum of front and face, bristles of thorax and pile of pleura, largely yellowish. Abdomen, except first segment and base of second, almost wholly bronze-colored tomentose; last segment in the male largely silvery tomentose; front tibiæ destitute of bristles. Length 9 mm.

Washington Territory! A single specimen (Williston).

6. **Anthrax consessor** n. sp.—Wholly black. Front yellowish-white tomentose and black pilose; face slightly retreating below, yellowish-white tomentose; proboscis not projecting beyond epistoma; first two joints of antennæ of nearly an equal length, third joint subglobular at its base, the styliform portion slender and linear; occiput white tomentose. Thorax behind golden yellow tomentose, the dorsum black pilose, sides and front end yellowish pilose, bristles of hind angles reddish; pleura yellowish pilose; scutellum on hind margin golden yellow tomentose, the bristles black. Abdomen black tomentose, a crossband of yellowish tomentum on bases of second, third and fourth segments

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and one of deep, reddish-brown tomentum on bases of the fifth and sixth segments, last segment silvery-white tomentum in the male, deep reddish-brown tomentose in the female; pile of sides of first, second and fourth segments white, of the others black, on first four segments abundant, on the remaining segments sparse; venter white tomentose, a black tomentose crossband on base of each segment except the first and second, and sometimes of the third. Legs whitish tomentose, front tibiæ destitute of bristles, claws of front tarsi minute. Wings hyaline, costal cell yellowish; antecostal cell wholly black tomentose, no epaulette of silvery tomentum at base of wings in either sex. Length 7 mm.

California! Six specimens.

7. **Anthrax alternata** Say (Syn. *A. stenozona* Loew!, *A. scrobiculata* Loew!, *A. albipectus* Macq.!, *A. connexa* Macq.!, *A. consanguinea* Macq.)—Differs from *consessor* as follows: Tomentum of last three abdominal segments yellowish-white, instead of deep reddish-brown; pile of sides of last segment white, of hind angle of second segment usually black; last segment in male never wholly silvery-white tomentose; pile of pleura sometimes very dark and mixed with several black ones; front tibiæ sometimes provided with bristles, claws of front tarsi small; antecostal cell sometimes largely yellowish tomentose. Length 11-14 mm.

New York!, Maryland!, Florida!, Montana!, Nebraska!, Illinois. Fourteen specimens.

Var. **hypomelas** Macq. (*Anthrax hypomelas* Macq.)—Differs from the typical *alternata* in that the pile on sides of fourth abdominal segment is wholly black, instead of largely whitish; pile of breast, coxæ and venter, and tomentum of legs largely black. Length 14 mm.

Canada!, Pennsylvania, Wis. A single specimen (Provancher).

Var. **lateralis** Say (*Anthrax lateralis* Say; syn. *A. Bastardi* Macq.; *A. gracilis* Macq.!)—Has the pile and tomentum of thorax and abdomen golden-yellow where it is whitish or pale yellowish in the typical *alternata*. Length 8-12 mm.

New Jersey!, Florida!, Canada!, Colorado, Washington Territory! Six specimens.

Var. **perimele** Wied. (*Anthrax perimele* Wiedemann, Aus. Zwei. Ins. I, 583) —Has the tomentose crossbands on third and fifth abdominal segments yellowish, those on the other segments white, while in the typical *alternata* all of these crossbands are yellowish, or else all of them are white. Length 10 mm.

California!, Brazil (Wied.). Six specimens in May. They agree throughout with Wiedemann's description of *perimele* above quoted.

Var. **fulvipes** n. var.—Differs from the typical *alternata* in having the legs reddish-yellow instead of black, and the front tibiæ are destitute of bristles. Length 10 mm.

Arizona! A single specimen (Keen).

8. **Anthrax mercedis** n. sp.—Front reddish, above black, brown and white tomentose and reddish or black pilose; face reddish, much produced below, yellowish-white tomentose; proboscis not projecting beyond epistoma; antennæ

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reddish, the third joint black, elongate-conical at its base; occiput white tomentose. Thorax black, white tomentose, sides and front end yellowish-white pilose, bristles yellowish, pleura white tomentose, pile of front part yellowish-white; scutellum black, white tomentose, bristles yellowish. Abdomen black, apex partly or wholly reddish, white tomentose, that of apex of each segment except the first, yellowish; sides whitish pilose, rarely a few black ones on fifth segment and hind part of dorsum of abdomen; pile of sides depressed except on first two segments; no silvery tomentum at tip of male abdomen; venter reddish, white tomentose and pilose. Legs reddish, yellowish tomentose, front tibiæ provided with bristles; tarsi black, claws of front tarsi well developed. Wings hyaline, costal cell yellowish; antecostal cell yellowish-white tomentose, the front edge with a narrow fringe of black pile. Length 11-14 mm.

California! Eleven specimens in July.

9. **Anthrax fulviana** Say.—Wholly black. Front yellowish tomentose and black pilose; face somewhat produced below, yellowish tomentose; proboscis not projecting beyond epistoma; first antennal joint about twice as long as the second, third joint short, conical at its base; occiput yellowish tomentose. Thorax mixed black and sparse yellowish tomentose, yellowish pilose, bristles of hind angles also yellowish; breast, coxæ and pleura yellowish pilose; scutellum mixed black and sparse yellowish tomentose, yellowish pilose, bristles also yellowish. Abdomen black and sparse yellowish tomentose, everywhere covered with long, erect, yellowish pile; venter yellowish pilose. Legs yellowish tomentose, front tibiæ provided with bristles, claws of front tarsi small. Wings hyaline, costal cell yellowish. Length 11 mm.

New Mexico!, Colorado, British America, Washington Territory! Three specimens.

Var. **nigricauda** Loew (Syn. *Anthrax nigricauda* Loew).—Differs from the typical *fulviana* only in having numerous black pile on the face, breast, coxæ, venter, dorsum of last four abdominal segments and hind margin of the last segment; first basal and base of marginal cell tinged with yellowish, an indistinct yellowish cloud on veins at bases of first submarginal and first superior cells. Length 12 mm.

Canada!, Massachusetts. Two specimens.

10. **Anthrax mucorea** Loew.—Differs from *consessor* as follows: Legs usually yellowish; epistoma usually slightly produced; proboscis sometimes projects length of the labellæ beyond epistoma; tomentum of thorax and scutellum usually yellowish-white, bristles of the latter yellowish; fifth and following segments of abdomen destitute of deep reddish-brown tomentum; pile of sides of abdomen long and abundant, usually pale yellowish, that in front angles of segments five and six generally black; no crossband of black tomentum at base of fourth segment of the venter; tomentum at apex of each femur in front black; antecostal cell yellowish tomentose, the front border with a fringe of yellow and black pile. Length 8-10 mm.

Nebraska!, California! (Oct.-Nov.) Twenty-four specimens.

The pile and tomentum of thorax and abdomen is sometimes golden-yellow; I took a male of this kind united in coitu with a female having the pile and tomentum of thorax and abdomen pale yellowish.

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11. **Anthrax molitor** Loew.—Differs from *mucorea* in that the last segment in the male is never silvery tomentose, pile of dorsum of abdomen more erect and abundant, antecostal cell sometimes silvery-white tomentose, black pile on its front border more abundant, epistoma considerably retreating. Length 7-17 mm.

California!, Arizona!, Colorado. Forty-seven specimens.

Var. **pretiosa** n. var.—Has the pile and tomentum of thorax and abdomen deep golden-yellow, black pile on sides of fifth and sixth abdominal segments sparse or wanting, and the legs largely or wholly black. Length 10-14 mm.

California! Thirteen specimens.

Var. **vacans** n. var.—Differs from the typical *molitor* in having numerous black pile on the breast in front, and also at the apex of the abdomen; sides of fifth and sixth abdominal segments wholly black pilose. Length 16 mm.

Washington Territory! A single female specimen (Williston).

Specimens of the European *Anthrax flava* received from Herr V. von Röder agree in nearly every respect with *A. molitor*, except that the bristles on hind margin of scutellum are black instead of yellow.

12. **Anthrax turbata** n. sp.—Differs from *mucorea* as follows: Legs black; epistoma considerably produced; proboscis not projecting; tomentum of thorax and scutellum wholly yellowish, bristles of scutellum and pile of front part of breast black; tomentum on apex of first segment of abdomen white; pile of sides of first segment abundant, white; of the other segments and dorsum of last three segments very sparse and mostly black; last segment in the male destitute of silvery-white tomentum; venter (apparently) wholly yellowish tomentose; front edge of antecostal cell destitute of black pile. Length 6 mm.

California! Two specimens.

13. **Anthrax proboscidea** Loew.—Black, the legs and antennæ sometimes largely reddish. Front white tomentose, the upper part yellowish tomentose, black pilose; face considerably produced below, white tomentose in the middle, the sides yellowish tomentose; proboscis projects half its length beyond epistoma; first two joints of antennæ of nearly an equal length, third joint subglobular at its base, the styliform portion slender, linear and longer than the rest of the antennæ; occiput yellowish tomentose. Thorax yellowish tomentose, front end yellowish pilose, sides yellowish and black pilose, bristles of hind angles black; pleura yellowish and black pilose, breast and coxæ largely black pilose; scutellum yellowish tomentose, bristles black. Abdomen yellowish tomentose, that on last segment white; pile of sides of abdomen abundant, black; that on sides of first two segments and in front angles of the other segments white; venter yellowish tomentose. Legs yellowish and black tomentose, front tibiæ provided with bristles, claws of front tarsi well developed. Wings hyaline, costal cell brownish, the following spots brown; one in middle of first basal cell; in middle of marginal cell and a larger one in outer end of this cell extending across first submarginal cell, covering vein at base of second submarginal cell; one on veins at base of each posterior cell, of first submarginal and of discal cell; one near tip of second vein and another near tip of anterior branch of third vein; extreme base of marginal and of first and second basal cells also brown. Length 6 mm.

Arizona!, Mexico. A single specimen, somewhat rubbed (Keen).

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14. **Anthrax anna** n. sp.—Wholly black. Front yellowish tomentose and black or yellowish pilose; face but little produced below, yellowish tomentose; proboscis not projecting beyond epistoma; third joint of antennæ subglobular at its base, the styliform portion slender and linear, first antennal joint much less robust than the second; occiput white tomentose. Thorax yellowish tomentose, a stripe of white tomentum extends from humeri to hind angles of thorax, passing above and below root of each wing; bristles on hind angles of thorax reddish, the others black; scutellum yellowish tomentose, that at the base white; bristles black. Abdomen yellowish tomentose, that on last two segments whitish, on bases of second, third and fourth segments white; sides of first two segments long white pilose, sides of other segments and dorsum of last three segments sparse black pilose; venter and breast wholly black tomentose and pilose. Legs yellowish tomentose, front tibiæ destitute of bristles, claws of front tarsi well developed. Wings hyaline, costal and first basal cell yellowish, second basal cell and bases of discal and marginal cells sometimes tinged with yellowish, veins at bases of first and fourth posterior cells, and sometimes the one at base of first submarginal cell bordered with brown. Length 4–7 mm.

California! Twelve specimens.

15. **Anthrax supina** n. sp.—Differs from *anna* as follows: Tomentum of face white; second joint of antennæ not noticeably more robust than the first; base of third joint short conical. Thorax mixed yellow and black tomentose, the front end, sides and pleura white pilose, bristles of thorax mostly reddish; no white tomentum at base of scutellum; tomentum of abdomen yellowish, that on second segment white, on apices of third, fourth and extreme apex of fifth segment black; tomentum of first two segments of venter and pile of front end of breast white; tomentum of legs black, claws of front tarsi small; veins at bases of first submarginal and fourth posterior cells never bordered with brown. Length 7 mm.

California! Two specimens.

16. **Anthrax inops** n. sp. (Syn. ?*A. costata* Say!)—Same as *anna*, except face largely black; occiput pale yellowish tomentose. Thorax destitute of stripes of white tomentum, bristles of hind angles black. Abdomen white tomentose, base of third segment and apices of the fifth and sixth yellowish tomentose, apices of second and third segments and bases of the fifth and sixth black tomentose; sides of the first four segments abundant whitish pilose, of the other segments sparse black pilose. Legs wholly black tomentose, front tibiæ provided with bristles, claws of front tarsi small; hind legs fringed above and below with long flattened scales; base of marginal cell and second basal cell, except its front margin, brown. Length 8 mm.

California! A single male specimen (Williston).

17. **Anthrax eudora** n. sp.—Black, first antennal joint and the legs reddish. Front white or yellowish tomentose and black or yellowish pilose; face slightly projecting below, yellowish tomentose, that in the middle above sometimes white; proboscis not projecting beyond epistoma; first joint of antennæ about twice as long as the second, the third joint subglobular or short conical at its base; occiput white tomentose, that in the centre yellowish. Thorax yellowish tomentose, a crossband of white tomentum near its front edge extending

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to hind angles of thorax, passing above root of each wing; bristles on hind angles reddish, the others sometimes black; pleura yellowish pilose, that below root of each wing white; scutellum yellowish tomentose, that at the base white; bristles black or reddish. Abdomen yellowish tomentose, paler or white on the last three segments and bases of the second and third; pile on sides of first two segments abundant, white; that on sides of other segments and dorsum of abdomen posteriorly sparse and chiefly black; venter yellowish tomentose. Legs yellowish tomentose; front tibiæ destitute of bristles, claws of front tarsi minute. Wings hyaline, costal, first basal and proximal half of marginal (except sometimes a triangular hyaline spot in base of the latter) brown; a brown cloud on veins at bases of first submarginal, first, third and fourth posterior cells. Length 6 mm.

California! Twelve specimens in October.

18. **Anthrax caprea** n. sp.—Black, the legs reddish. Front above brownish, below white tomentose; face retreating below, white or yellowish tomentose; proboscis projects from one-fourth to one-half its length beyond epistoma; first joint of antennæ about three times as long as the second, base of the third joint conical; occiput white tomentose, that in middle above yellowish. Thorax mixed white and yellowish tomentose, sometimes with a white tomentose crossband on the front edge extending to hind end of thorax above root of each wing; bristles on hind angles reddish; pleura yellowish pilose, that beneath root of each wing white; scutellum yellowish tomentose, that at the base white; bristles reddish. Abdomen yellowish tomentose, that at base of each segment white, most extended on the second segment; sides of first two segments abundant white pilose, sides and dorsum of other segments sparse black pilose; venter yellowish tomentose. Legs yellowish tomentose, front tibiæ destitute of bristles, claws of front tarsi small. Wings hyaline, costal and first basal cell, and sometimes proximal half of marginal cell largely yellowish; a brown cloud on veins at bases of first submarginal, first, third and fourth posterior cells, and sometimes on those at bases of discal and second submarginal cells; usually a stump of a vein projects into first submarginal cell from vein at base of second submarginal cell. Length 8–10 mm.

California! Nineteen specimens in October.

19. **Anthrax inaurata** n. sp.—Front black, next the antennæ reddish tomentose, black or yellowish pilose; face yellowish, much produced below, yellowish tomentose; proboscis projects one-half its length or less beyond the epistoma; first two joints of antennæ yellowish, the third black, subglobular at its base, the styliform portion very slender and linear; occiput yellowish tomentose, that in the middle above more reddish. Thorax black, yellowish pilose and reddish tomentose, the usual bristles reddish; pleura yellowish pilose; scutellum black, reddish tomentose, the base narrowly white tomentose, extending on hind end of thorax to root of wings; bristles reddish. Abdomen black, the sides reddish, which color is most extended posteriorly; tomentum of abdomen yellowish, that on segments 3–6 in the male in certain lights shining like burnished gold, not at all shining in the female; pile of sides of first two segments yellowish, abundant; that on sides and hind edges of last two or three segments very sparse and mostly black; venter reddish, its tomentum yellowish, but sometimes largely black. Legs yellowish, front tibiæ provided with bristles; tarsi black towards

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the apex, claws of front tarsi well developed. Wings hyaline, costal cell yellowish, proximal half of first basal cell brownish, a brown cloud in marginal cell above base of first submarginal cell, a brown cloud on veins at bases of first submarginal and first posterior cells, and sometimes on those at bases of second submarginal and second, third and fourth posterior cells. Length 4–8 mm.

California!, Washington Territory! Twenty-four specimens.

20. **Anthrax lauta** n. sp.—Differs from *inaurata* only as follows: Face but little produced below; occiput (except in the middle above) with tomentose; a curved crossband of white tomentum on thorax in front of the middle, reaching to root of each wing; a crossband of white tomentum at bases of second and third abdominal segments; no shining tomentum on the third and fourth segments in the male; pile of hind part of abdomen wholly yellowish. Wings have the first basal and base of marginal cell brownish. Length 6 mm.

California! A single specimen.

21. **Anthrax agrestis** n. sp.—Differs from *inaurata* only as follows: Occiput white tomentose. Thorax with a curved white tomentose crossband in front of the middle reaching to root of each wing. Abdomen with a white tomentose crossband at bases of the second and third segments; segments 4–6 shining golden tomentose in the male. Length 7–8 mm.

California! Four specimens.

22. **Anthrax camprestris** n. sp.—Differs from *inaurata* only in having no shining tomentum on the abdomen of the male, and in having a crossband of black tomentum on base of fourth segment; there is sometimes a crossband of white tomentum on bases of second and third segments. Length 4–6 mm.

California! Seven specimens.

23. **Anthrax atrata** n. sp. (Syn. ? *A. cedens* Walk.!)—Wholly black, the pile and tomentum also wholly black, except a few whitish pile on front end of thorax; a deep fovea near centre of the front; first joint of antennæ about twice as long as the second, third joint very elongate-conical at its base, the styliform portion scarcely one-half as long as the thickened basal part; face slightly produced below; proboscis projects length of its labellæ or less beyond the epistoma. Front tibiæ provided with bristles, claws of front tarsi well developed. Wings hyaline at the apex, the base brownish-black, the outline of this color extends from near apex of first vein to hind margin beyond apex of fifth vein in third posterior cell, curving outward so as to include base of second posterior cell; a hyaline spot in bases of second basal and anal cells and near apex of discal cell, besides sometimes a subhyaline spot in bases of marginal, discal and third posterior cells, centre of fourth posterior and axillary cells and apex of each of the basal cells. Length 13–16 mm.

California! Twenty-seven specimens in September.

24. **Anthrax miscella** n. sp.—Black, lower part of front, face, first two antennal joints, scutellum, except at base, sides and apex of abdomen, venter, femora and tibiæ reddish. Front and face yellowish tomentose and black pilose, a deep fovea near centre of front; face retreating below; proboscis not projecting beyond epistoma; occiput yellowish tomentose. Thorax with a bluish cast, yellowish tomentose, dorsum black pilose, sides and front end yellowish pilose,

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bristles largely or wholly reddish; pleura pale yellowish pilose; scutellum yellowish tomentose, bristles black. Abdomen pale yellowish tomentose, middle of dorsum largely black tomentose; sides black pilose, first segment and bases of the second and third, pale yellowish pilose; venter on first four segments white tomentose and pilose, that on remaining segments yellowish and black. Legs yellowish and black tomentose, front tibiæ provided with bristles, claws of front tarsi minute; apex of wings hyaline, the base brown, the outline of this color extending from near apex of first vein to base of second submarginal cell, then in and out through base of second posterior cell, reaching hind margin of wing beyond tip of penultimate vein, forming large teeth at each vein it crosses, that on vein between third and fourth posterior cells nearly reaching hind margin of wing. Length 15 mm.

Washington Territory!, California! Two specimens.

25. **Anthrax curta** Loew.—"Wholly deep black, opake. Legs concolorous. Head spherical; prothorax, first abdominal segment wholly, and the last three segments largely, white pilose; four corners of the thorax fulvous pilose; rest of body clothed with black pile and tomentum. Length of body 4¾ lines (= little over 9 mm.) of the wings, $4\frac{7}{12}$ lines.

"Deep black, opake. Head concolorous, spherical, face not prominent; front much narrowed toward the vertex, clothed with very short black pile and black tomentum; tomentum of face black, varied with white and brownish; antennæ black, first two joints closely black pilose; proboscis not prominent; occiput snow-white tomentose, near the vertex short white pilose. Thorax clothed with short black pile and black tomentum; prothorax white pilose; humeri and posterior angles fulvous pilose; posterior margin short fulvous pilose; scutellum black tomentose and black pilose, posterior margin fulvous tomentose. First segment of abdomen wholly snow-white pilose, second, third and fourth segments black tomentose, towards the sides, and the sides themselves, closely black pilose; last three segments in centre of dorsum black tomentose, toward the sides snow-white tomentose, the margins snow-white pilose; venter blackish fuscous, first two segments snow-white tomentose, the others black tomentose. Legs wholly black, posterior tibiæ above closely setulose. Wings hyaline, basal half black; termination of black apex of auxiliary vein obliquely to the fourth posterior cell, thence parallel with the hind margin to axillary angle, where the black color emits a tooth. [Dipt. Amer., Cent. octava, p. 22.] California."

Unknown to me; the above is a translation of Loew's original description.

26. **Anthrax scitula** n. sp.—Wholly black. Front yellow and white tomentose and black pilose; face slightly produced below, yellowish tomentose; proboscis not projecting beyond epistoma; first two joints of antennæ of nearly an equal length, third joint short conical at its base; occiput white tomentose. Thorax coppery tomentose, the dorsum black pilose, sides white pilose, front end and pleura yellowish pilose; bristles of hind angles reddish; scutellum coppery tomentose, bristles black and reddish. Abdomen black tomentose, that on apex of first and base of third segment whitish, that on the fourth and following segments largely yellowish, sometimes having a coppery tinge; pile on sides of first two segments abundant, whitish; that on remaining segments sparse, mixed yellowish and black; venter yellowish tomentose. Legs yellowish tomentose,

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front tibiæ destitute of bristles, claws of front tarsi small. Wings hyaline at the apex, the base blackish-brown, the outline of this color extending from near tip of auxiliary vein to second vein, then basally a short distance, then transversely to fifth vein in base of third posterior cell, then curving to hind margin of wing at apex or last third of axillary cell; the brown fills base of discal cell to small crossvein. Length 4-6 mm.

California! Three specimens in April.

27. **Anthrax vana** n. sp.—Differs from *scitula* only as follows: Face black pilose; proboscis one-half length of the labellæ beyond the epistoma; first antennal joint twice as long as the second; occiput yellowish tomentose. Thorax yellowish tomentose, its sides yellowish pilose, the bristles black; breast black pilose; scutellum yellowish tomentose, the bristles black; tomentum of abdomen black, that on the first segment and bases of the second and third white, on base of the fourth and nearly all of the fifth and sixth yellowish, mixed with black; tomentum of venter black, that on first two segments white; tomentum of legs black; outline of brown of wing not well defined, extending from tip of auxiliary vein to apex of discal cell, then curving to apex of anal cell. Length 7 mm.

California! Two specimens.

28. **Anthrax celer** Wied. (Syn. ? *A. floridana* Macq.!)—Differs from *scitula* as follows: Tomentum of front and face black and golden-yellow; epistoma retreating; base of third antennal joint subglobular. Thorax velvet black and golden-yellow tomentose, its sides and the pleura golden-yellow pilose; tomentum of scutellum golden-yellow. Abdomen black and golden-yellow tomentose, sides of first segment golden-yellow pilose, of the second, third and fourth segments black; venter black and golden-yellow tomentose. Legs black tomentose; outline of brown of wings nearly straight, extending from last eighth of first vein to apex of axillary cell. Length 7 mm.

Kentucky, Georgia, Venezuela (S. A.)! A single specimen from the latter locality received from V. von Röder, Hoym, Germany.

29. **Anthrax syrtis** n. sp.—Front black, below reddish, golden-yellow tomentose and black pilose. Face reddish, the middle sometimes black, very much produced below, golden-yellow tomentose; proboscis projecting one-third its length or less beyond the epistoma; first joint of antennæ and sometimes the second reddish; third joint black, elongate-conical at its base; occiput white tomentose, that in the middle above yellowish. Thorax black, yellowish tomentose, a white tomentose stripe extends from humeri to hind angles of thorax, passing above root of each wing; front end of thorax yellowish pilose; bristles of hind angles reddish; pleura white pilose, that next the head yellowish; scutellum black, yellowish tomentose, that at the base white; bristles reddish. Abdomen black, yellowish tomentose, that on bases of second and third segments usually white, on apices of second, third, fourth and fifth segments black, most extended on the second segment and sometimes wanting on the fourth and fifth; sides of first two segments abundant white and yellowish pilose, a cluster of black pile on hind angles of second segment; sides of other segments mixed black and yellowish pilose, rather sparse and depressed; dorsum of abdomen with numerous black pile; venter black, yellowish tomentose. Legs yellowish, yellowish tomentose, front tibiæ provided with bristles; tarsi black toward the

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tips, claws of front tarsi well developed. Wings hyaline at the apex, the base brownish, the outline of this color extending from near apex of auxiliary vein transversely to second vein, then basally nearly to base of this vein, then transversely to discal cell, then basally to first fourth of this cell, then curving through bases of third and fourth posterior cells, then basally to or beyond extreme base of fourth posterior cell, then curving to hind margin at axillary incision; hyaline part of discal cell extends half way from small crossvein to base of that cell, apex of anal cell to or beyond extreme base of fourth posterior cell hyaline. Length 8–11 mm.

California! Twenty-eight specimens in April.

30. **Anthrax bigradata** Loew (Syn. ? *A. albovittata* Macq.!).—Wholly black, the legs sometimes reddish. Front and face golden-yellow tomentose and black pilose, face slightly produced below; proboscis not projecting beyond epistoma, first two joints of antennæ of nearly an equal length, the third joint subglobular at its base the styliform portion linear and quite slender; occiput golden-yellow tomentose. Thorax yellowish or coppery tomentose, the dorsum black pilose, the sides and front end yellowish pilose; bristles of hind angles black; pleura black pilose, sometimes mixed with yellowish; scutellum yellowish or coppery tomentose, bristles black. Abdomen black tomentose, that on the fourth segment white, on the fifth and following segments largely or wholly yellowish; pile of first segment white, of the other segments on the sides abundant, black: venter yellowish tomentose and black pilose. Legs yellowish tomentose, front tibiæ destitute of bristles, claws of front tarsi minute. Wings hyaline at the apex, the base blackish-brown, the outline of this color extending from near apex of auxiliary vein transversely to second vein, then basally a short distance, then transversely to fourth vein at last fourth of discal cell, then basally to beyond middle of this cell, then curving around through bases of third and fourth posterior cells, reaching hind margin at last third of axillary cell. Length 7–10 mm.

California!, Cuba. Six specimens in April.

31. **Anthrax fulvohirta** Wied. (Syn. *A. conifuscies* Macq.; *A. separata* Walk.)—Black, first two joints of antennæ, sides of abdomen broadly, and the legs, reddish. Front golden-yellow tomentose and black pilose; face much produced below, golden-yellow tomentose; proboscis projecting length of labellæ or less beyond epistoma; first joint of antennæ about twice as long as the second, third joint elongate-conical at its base; occiput golden-yellow tomentose. Thorax golden-yellow tomentose, sides and front end yellowish pilose, bristles of hind angles yellowish; pleura yellowish pilose, breast yellowish and black pilose; scutellum yellowish tomentose, bristles yellowish. Abdomen golden-yellow tomentose, sides of first two segments abundant yellowish pilose, sides of other segments mixed yellowish and black pilose, more sparse and depressed; venter yellowish tomentose. Legs golden-yellowish tomentose, front tibiæ destitute of bristles, claws of front tarsi small. Wings hyaline at the apex, the base dark brown, the outline of this color extending from near apex of auxiliary vein transversely to second vein, then basally a short distance, then transversely to third vein, then basally a short distance, then obliquely to apex of axillary cell, forming triangular projections on the veins it crosses. Length 8–12 mm.

New Jersey!, Virginia, Georgia!, Kansas! Five specimens.

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32. **Anthrax cautor** n. sp.—Wholly black. Front yellowish-white tomentose and black pilose; face slightly produced below, black and yellowish tomentose; proboscis not projecting beyond epistoma; first two joints of antennæ of nearly an equal length, the third joint subglobular at its base, the styliform portion slender and about as long as rest of antennæ; occiput white tomentose. Thorax yellowish and white tomentose, sides and front end yellowish pilose, pile and bristles of the hind part black; pleura white pilose, that on lower part and on the coxæ largely black; scutellum yellowish tomentose, that at base largely white, pile and bristles black. Abdomen white tomentose, more yellowish on apex of each segment, that on apex of fourth segment broadly black, on apices of second and third segments mixed with black; sides of first two segments quite densely white pilose, sides of other segments and dorsum of abdomen very sparsely black pilose; venter brownish tomentose. Legs mixed yellowish and white tomentose, front tibiæ destitute of bristles, claws of front tarsi well developed. Wings hyaline at the apex, the base blackish-brown, the outline of this color extending from near apex of first vein transversely to second vein, then basally a short distance, then curving outward over third vein, then basally to fourth vein a little beyond small crossvein; then curving basally through discal cell opposite small crossvein and through base of third posterior cell, then basally to extreme base of this cell, then nearly straight to hind margin near apex of axillary cell; middle of anal and base of axillary cells largely subhyaline; a brown cloud on veins at bases of second submarginal and second posterior cell, that on the former sometimes united with the brown in marginal cell, crossing the first submarginal cell. Length 5–7 mm.

California! Three specimens in September and October.

33. **Anthrax edititia** Say (Syn. ? *A. diagonalis* Loew!, ? *A. vestita* Walk.!). —Front black, reddish below, golden-yellow tomentose and black pilose; face reddish, very much produced below, golden-yellow tomentose; proboscis projects one-third its length or less beyond the epistoma; first joint of antennæ, and sometimes the second, reddish; third joint black, elongate-conical at its base; occiput yellowish or white tomentose. Thorax black, yellowish tomentose, the sides and front end yellowish pilose, that above root of each wing sometimes white, the usual bristles yellowish; pleura yellowish pilose, that below root of wing sometimes white; scutellum black, tomentum and bristles yellowish. Abdomen black, the apex sometimes reddish, wholly yellowish tomentose and pilose, rarely with a few black pile posteriorly; venter black, sometimes largely reddish, yellowish tomentose. Legs reddish, yellowish tomentose, front tibiæ provided with bristles; tarsi black towards the apex, claws of front tarsi well developed. Wings hyaline at the apex, the base brownish, the outline of this color extending from near apex of auxiliary vein obliquely to second vein (or transversely to this vein, then basally a short distance) then transversely to discal cell, then basally to first third or fourth of this cell, then curving through bases of third and fourth posterior cells, ending in hind margin at axillary incision, or at apex of anal cell; sometimes the brown color is very pale, even to subhyaline with brown clouds on veins at bases of first submarginal, first, third and fourth posterior cells; sometimes a brown cloud on veins at bases of second submarginal and second posterior cells. Length 9–12 mm.

Kansas!, California!, Montana! Fifty-nine specimens in Sept.

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Var. **fulvicoma** n. var.—Differs from the typical *edititia* only in having the tomentum of front and face, and pile and tomentum of thorax and abdomen deep reddish, instead of yellowish.

California!, Kansas! Five specimens.

34. **Anthrax adumbrata** n. sp.—Differs from *edititia* only as follows: Epistoma but little produced; proboscis not projecting beyond epistoma; scutellum largely or wholly, sides and apex of abdomen usually, and venter wholly, reddish; front tibiæ destitute of bristles, claws of front tarsi minute. Wings grayish hyaline, costal and base of first basal cell yellowish, base of marginal and apex of first basal cell also sometimes yellowish; a brown cloud on veins at bases of first submarginal, first and fourth posterior cells. Length 9-14 mm.

California! Seven specimens.

35. **Anthrax palliata** Loew (Syn. *A. incisa* Walk.)—Differs from *edititia* in that the front and middle of the face is black, dorsum of thorax short black pilose, sides of thorax, pleura, breast and sides of abdomen posteriorly with several black pile; tomentum and pile of head, thorax and abdomen deep reddish where in *edititia* it is yellowish, tomentum of last one or two segments of abdomen whitish; brown of wings with a blackish tinge. Length 13 mm.

Illinois, Nebraska! Two specimens in September.

36. **Anthrax perplexa** n. sp.—Black, the face, apex of abdomen, venter and legs, sometimes largely reddish. Front yellowish tomentose and black pilose; face much produced below, yellowish tomentose; proboscis projects one-fourth its length or less beyond epistoma; third joint of antennæ short-conical at its base; occiput white tomentose. Thorax yellowish tomentose, the sides and front end yellowish pilose, bristles of hind angles yellowish; pleura yellowish pilose, that below root of each wing sometimes white; scutellum yellowish tomentose, bristles yellowish. Abdomen yellowish tomentose, that on hind margins of second, third and fourth segments usually black, on bases of second and third segments sometimes whitish; pile on sides of first three segments abundant, whitish; on sides of other segments sparse and depressed, yellowish: sometimes with a few black ones intermixed; venter yellowish tomentose. Legs yellowish tomentose, front tibiæ provided with bristles, claws of front tarsi well developed. Wings hyaline at the apex, the base brownish, the outline of this color quite straight and even, extending from near apex of auxiliary vein obliquely to apex of anal cell, but sometimes the apex of this cell and greater part of axillary cell is in the hyaline part; the brown color fills base of discal cell to or beyond small crossvein, and base of third posterior cell to some distance beyond base of fourth posterior cell, and sometimes to hind margin of wing. Length 5-9 mm.

California! Thirty-six specimens in July.

37. **Anthrax vigilans** n. sp.—Same as *perplexa*, except: Lower part of front, face, first two antennal joints, and the legs, always reddish; base of third antennal joint elongate-conical. A white tomentose stripe above root of each wing; pile and tomentum of abdomen almost wholly white, none black; outline of brown of wings not well defined; brown does not fill base of discal cell to small crossvein. Length 7-8 mm.

California! Four specimens.

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38. **Anthrax fumida** n. sp.—Front black, reddish tomentose and black pilose; face obscure reddish, much produced below, reddish tomentose; proboscis projects one-fourth its length or less beyond epistoma: first two joints of antennæ reddish, the third black, short-conical at its base; occiput white tomentose. Thorax black, golden-yellow tomentose, sides and front end yellowish pilose, bristles of hind angles yellowish; pleura yellowish pilose; scutellum black, yellowish tomentose, bristles yellowish. Abdomen black, the apex sometimes reddish, golden-yellow tomentose; pile of sides yellowish; venter black, yellowish tomentose. Legs reddish, yellowish tomentose, front tibiæ provided with bristles; tarsi black toward the apex, claws of front tarsi well developed. Wings hyaline at the apex, the base brownish, the outline of this color not well defined, the brown being gradually evanescent posteriorly, leaving an indistinct border to the veins traversing the more hyaline part, except the apices of veins two to four; brown fills anal and axillary cells to their very tips, and the discal cell to beyond small crossvein. Length 5-7 mm.

California! Nine specimens.

39. **Anthrax impiger** n. sp.—Front black, yellowish tomentose and black pilose; face reddish, in middle above black, much produced below, yellowish tomentose; proboscis projecting about length of its labella beyond epistoma; first two joints of antennæ of nearly an equal length, reddish; the third black, very elongate-conical at its base: occiput yellowish tomentose. Thorax black, yellowish tomentose and pilose, bristles of hind angles yellowish; pleura yellowish pilose; scutellum black tomentose and bristles yellowish. Abdomen black, sides broadly reddish, yellowish tomentose; sides of abdomen sparse yellowish pilose; venter reddish, yellowish tomentose and pilose. Legs yellowish, yellowish tomentose, front tibiæ destitute of bristles; tarsi toward the tips blackish, claws of front tarsi minute. Wings hyaline at the apex the base smoky yellowish, the outline of this color indistinct, extending from near apex of the auxiliary vein obliquely nearly to small crossvein, then transversely to discal cell, then curving inward through bases of third and fourth posterior cells, reaching hind margin at tip of penultimate vein; a brown cloud on veins at bases of second submarginal, first, third and fourth posterior, and the discal cell, and sometimes on that at base of second posterior cell. Length 8-10 mm.

Arizona! Two specimens (Keen).

40. **Anthrax dispar** n. sp.—Wholly black. Front yellowish tomentose and black pilose; face very much produced below, yellowish tomentose; proboscis not projecting beyond epistoma; first joint of antennæ nearly twice as long as the second, third joint elongate-conical at its base; occiput yellowish tomentose. Thorax yellowish tomentose, the sides and front end yellowish pilose, middle of dorsum black pilose, bristles of hind angles reddish; pleura yellowish and white pilose; scutellum yellowish tomentose, bristles black. Abdomen black tomentose, base of second and third, and nearly all of the fifth segment yellowish tomentose; pile of sides of first segment abundant, whitish; that on sides of remaining segments sparse, depressed, black; in front angles of second and third segments white; venter black tomentose. Legs black, tomentose, front tibiæ destitute of bristles, claws of front tarsi minute. Wings smoky hyaline, the apex purer hyaline, costal and first basal cell wholly, basal two-thirds of marginal cell and second basal cell, except small spot in apex, dark brown; a brown cloud on veins at bases of second submarginal, second and third posterior cells. Length 8 mm.

Florida! Two specimens (Morrison).

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41. **Anthrax plagosa** n. sp.—Black, sides of face and legs somewhat reddish. Front and face reddish tomentose and black pilose; face slightly retreating below; proboscis projects half its length beyond epistoma; first two joints of antennæ of nearly an equal length, the third joint subglobular at its base, the styliform portion slender, linear, and about as long as rest of antennæ; occiput yellowish tomentose. Thorax reddish tomentose, sides and front end yellowish pilose, bristles of hind angles black; pleura above yellowish pilose, that beneath root of each wing partly white; breast largely black pilose; scutellum black, yellowish tomentose, the pile and bristles black. Abdomen black tomentose, that on first segment, bases of second, third and fourth, and all of the fifth and following segments yellowish; pile of sides of first two segments abundant, yellowish; of the other segments rather sparse, black and yellowish; venter black and yellowish pilose. Legs yellowish and black tomentose, front tibiæ provided with bristles, claws of front tarsi well developed. Wings hyaline at the apex, the base blackish-brown, the outline of this color extends from near apex of auxiliary vein transversely to second vein, then basally a short distance, then transversely to discal cell, then basally nearly to small crossvein, then almost straight to apex of axillary cell, which is wholly brown; veins at bases of first submarginal, first and fourth posterior cells narrowly bordered with whitish-hyaline. Length 8-10 mm.

Arizona! Four specimens.

42. **Anthrax parvicornis** Loew.—Differs from *plagosa* only in that the first two antennal joints, apex of scutellum and of the abdomen is reddish and the apical half of the axillary cell is hyaline. Length 9 mm.

Illinois, Louisiana! Three specimens.

43. **Anthrax nugator** n. sp.—Front black, yellowish below, brownish tomentose and black pilose; face yellowish, considerably produced below, yellowish tomentose, that on hyperstoma black; proboscis projecting length of labellæ or less beyond epistoma; first two joints of antennæ reddish, the first twice as long as the second, third joint black, very elongate-conical at its base; occiput white tomentose, that in middle above yellowish. Thorax black, brownish tomentose, middle of dorsum black pilose, sides and front end yellowish pilose, bristles of hind angles yellowish; pleura yellowish pilose, that beneath root of each wing white; scutellum reddish, its base more or less black, yellowish tomentose, the bristles reddish. Abdomen black, the sides sometimes marked with reddish, yellowish tomentose, sometimes largely whitish, that on apices of second, third and fifth segments black, becoming less extended on each succeeding segment; last segment and middle of the preceding one whitish tomentose; pile on sides of abdomen long and abundant, yellowish; that on sides of fifth and sixth segments, and usually of the second also, largely black; several black pile on dorsum of abdomen posteriorly; venter reddish, yellowish tomentose, that on bases of last three segments black. Legs reddish, yellowish tomentose, front tibiæ destitute of bristles; tarsi black, claws of front tarsi minute. Wings hyaline at apex, the base brown, the outline of this color extending from near apex of auxiliary vein transversely to second vein, then curving to third vein near base of its anterior branch, then curving to fourth vein near apex of discal cell, then basally to last third of this cell, then curving zigzag through third posterior cell to fifth vein near its apex, then curving basally to penultimate vein near its apex, following this vein basally to base of fourth posterior cell, then curving to hind margin at last third of axillary cell; extreme base of wing,

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middle of costal cell, base of marginal cell and middle of first basal cell pale yellowish; a large hyaline spot on veins at bases of first submarginal, first, third and fourth posterior and of the discal cell. Length 8–16 mm.

California! Twenty-two specimens.

Var. **pallida** n. var.—Differs from the typical *nugator* only in having no black pile on sides of abdomen nor black tomentum on venter, brown of wings paler, not near reaching apex of discal cell, its outline not distinct, and costal cell wholly yellowish. Length 8–13 mm.

California!, Arizona! Nineteen specimens.

44. **Anthrax pertusa** Loew.—"Related to *Anthrax fenestrata* Fall., third joint of antenna conical, pile and tomentum of body largely white or whitish; wings hyaline, with two blackish brown crossbands a little abbreviated posteriorly, the basal one quite broad and subequal, the other much dilated anteriorly and enclosing a hyaline spot. Length of the body 4½ lines (= 9 mm.); of the wings, 4½ lines.

"Head black, face and anterior third of front clay yellowish; front and face white tomentose, front black pilose, anterior oral margin short black pilose; proboscis not prominent; first two joints of antennæ obscure clay yellowish, black pilose, the third black and conical. Thorax black, opake, tomentum and pile whitish, near the collar somewhat yellowish; scutellum red, the base black. Abdomen black, a large brick-red spot on each side, apex and venter clay yellowish; margins of abdomen white pilose, posterior angles of third segment and whole of segments five and six, black pilose. Legs yellowish brick-red, tarsi black. Halteres white. Wings hyaline, with two blackish-brown crossbands; the first subbasal, quite broad and of an equal width, extending from costa to the posterior angle, but not quite reaching hind margin of wing; anterior half of second crossband much dilated, enclosing a hyaline spot in which are situated the small crossvein and base of anterior branch of the third vein, posterior half of this crossband narrow, curving through the discal, third and fourth posterior cells; costal cell and base of wing tinged with subfuscous. New Mexico. [*Dipt. Amer. sept. indigena, Cent. octava*, p. 18."]

Unknown to me; the above is a translation of Loew's original description.

45. **Anthrax mira** n. sp.—Front black, yellowish tomentose and black pilose; face reddish, but little projecting below, yellowish tomentose; proboscis not projecting beyond the epistoma; first two joints of antennæ reddish, first joint about three times as long as the second, third joint black, short conical at its base; occiput yellowish tomentose. Thorax black, yellowish tomentose and pilose, pile on middle and hind part of dorsum black; bristles on hind angles of thorax reddish; pleura yellowish pilose; scutellum black, yellowish tomentose, bristles reddish or black. Abdomen reddish, a black triangular stripe extends from the base to the fifth segment, sometimes extending whole length of abdomen; tomentum of abdomen yellowish, that on apex of fourth segment broadly black, usually extending wholly across the segment in the middle of dorsum; pile on sides of first two segments abundant, white; that on sides of remaining segments sparse and yellowish, sometimes largely black; dorsum of abdomen sparse black pilose; venter reddish, base and central part sometimes black, whitish tomentose; Legs reddish, tarsi, hind tibiæ and tips of other tibiæ sometimes black; tomentum of legs yellowish, front tibiæ destitute of bristles, claws of front tarsi minute. Wings tinged with smoky brown from base to bases of

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second submarginal and second posterior cells, beyond which, and along the hind margin it is purer hyaline; costal cell wholly brown; a brown cloud on veins at bases of first and second submarginal, first, second, third and fourth posterior cells and at base of discal cell; second vein strongly S-shaped before its tip. Length 5-11 mm.

California! Twelve specimens.

46. **Anthrax tegminipennis** Say (Syn. *A. fuscipennis* Macq.!).—Front yellowish, the crown black, yellowish tomentose and black pilose; face yellow, somewhat produced below, yellow and black pilose; proboscis projects length of labellæ or less beyond epistoma; first joint of antennæ yellow, about three times as long as the second, second and third joints black, the third elongate-conical at its base; occiput yellowish tomentose. Thorax black, brownish tomentose, sides and front end yellowish pilose, bristles of hind angles yellowish; pleura, coxæ and breast yellowish pilose; scutellum reddish, its base black, yellowish tomentose and black pilose, bristles yellowish. Abdomen black, sometimes a reddish spot on sides of second segment; tomentum of abdomen yellowish, that on hind margin of each segment reddish; sides of abdomen abundant yellowish pilose, usually with several black ones on sides and dorsum posteriorly; venter black, yellowish tomentose and pilose. Legs reddish, yellowish tomentose, front tibiæ destitute of bristles; tarsi blackish toward the tips, claws of front tarsi minute. Wings usually brownish, somewhat lighter at apex and along hind margin, tinged with reddish towards the base. Length 9-14 mm.

Maine!, Canada!, Montana!, Arizona!, Iowa. Ten specimens.

Var. **Sackenii** n. var.—Differs from the typical *tegminipennis* in having pile of sides of abdomen whitish instead of yellowish, and the apex and hind margin of wings broadly nearly pure hyaline, instead of brownish. Length 14-15 mm.

Arizona!, Colorado. Three specimens.

This is undoubtedly the form referred to by Osten Sacken (West. Dipt. p. 241) as having a more hyaline latter half of the wings than *tegminipennis*.

47. **Anthrax lucifer** Fabr. (Syn. *A. fumiflamma* Walk.)—Differs from *tegminipennis* in having a black tomentose crossband on hind margin of each segment of the abdomen, and the legs are largely or wholly black; black pile of abdomen usually more numerous, forming clusters on hind angles of each segment except sometimes on the first three segments; hind margin of last segment usually densely black pilose. Length 12-15 mm.

California!, Louisiana!, Texas, Ga., W. Indies. Four specimens.

48. **Anthrax alpha** O. S.—Front yellow, the crown black, junction of these two colors sometimes reddish; tomentum of front yellowish, the pile black; face yellow, much produced below, yellowish tomentose, the epistoma usually black pilose; proboscis projects one-fourth its length or less beyond epistoma; first two joints of antennæ yellowish, the first about twice as long as the second, the third joint black, about as long as the first two, elongate-conical at its base; occiput yellowish or whitish tomentose. Thorax black, yellowish tomentose and pilose, hind part of dorsum black pilose, the usual bristles yellowish; pleura yellowish pilose, that beneath root of each wing sometimes white; scutellum reddish, the base black, yellowish tomentose, the pile and bristles black and yellowish. Abdomen black, the sides sometimes partly or wholly reddish; to-

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mentum of abdomen yellowish, that at apex of each segment usually reddish, on apex of segments two to six black, becoming less extended on each succeeding segment; pile on sides of abdomen abundant, yellowish mixed with black, except on first segment and anterior half of the second; pile of dorsum of abdomen sparse, mixed yellowish and black; venter reddish, sometimes partly black, yellowish tomentose and pilose. Legs reddish, yellowish tomentose, underside of hind legs sometimes black and black tomentose; front tibiæ destitute of bristles; tarsi reddish-black, claws of front tarsi minute. Wings yellowish-brown, the following parts hyaline: a small spot in apex of marginal cell; in apex of first submarginal cell nearly as long as second submarginal cell; all of second submarginal, second, third and fourth posterior cells, except border to veins, enclosing these cells; and a large spot in apex of discal cell; sometimes a subhyaline streak in middle of axillary cell; vein between discal and third posterior cells much bowed outward and emitting a stump of a vein which projects into third posterior cell. Length 11-15 mm.

California!, Wyoming. Thirty-nine specimens in Sept.–Nov.

Var. **fuliginosa** Loew (Syn. ? *A. fuliginosa* Loew).—Differs from the typical *alpha* in that the outline of the brown color of the wings is not well defined, the parts of the wing that in *alpha* are pure hyaline are here blackish-gray, and the veins between the submarginal and posterior cells are not distinctly bordered with brown. Length 10-13 mm.

California!, Texas! Six specimens in Sept.–Nov.

This is but an immature form of *alpha*.

49. **Anthrax Willistonii** n. sp. (Syn. "*Anthrax*, sp. nov., near *fuliginosa* Loew" Williston, Can. Ent. vol. xi, p. 216.)—Differs from *alpha* in that the middle part of veins between first and second submarginal cells and between discal and third posterior cell, and sometimes that between the third and fourth posterior cells are not bordered with brown, and the axillary cell, except its base and apex is wholly hyaline. Length 11-14 mm.

California!, New Mexico!, Colorado. Four specimens.

50. **Anthrax halcyon** Say.—Differs from *alpha* in having the third posterior cell divided by a crossvein into two cells of nearly an equal length (in two of my specimens this crossvein is reduced to a stump of a vein in one of the wings) and the brown of the wings has a blackish tinge. Length 13 mm.

Kansas!, Nebraska!, Colorado, British America. Six specimens.

51. **Anthrax ceyx** Loew (Syn. ? *A. demogorgon* Walk.).—Front brownish, the crown black tomentose and pilose; face reddish, much produced below, black tomentose and pilose; proboscis projects length of labellæ or less beyond epistoma; first joint of antennæ reddish, about three times as long as the second, second and third joints black, the third elongate-conical at its base; occiput black, reddish tomentose. Thorax black, reddish tomentose, front end reddish pilose, sides reddish and black pilose, bristles of hind angles reddish and black; pleura reddish and black pilose; scutellum reddish, the base black, reddish tomentose, bristles reddish and black. Abdomen black, the sides sometimes partly reddish, mixed black and reddish tomentose; pile of sides black, that on sides of first and second segments largely reddish, on the others mixed with a few reddish ones; venter reddish, mixed reddish and black pilose. Legs reddish, sometimes partly black, reddish tomentose, front tibiæ destitute of bristles; tarsi

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black, claws of front tarsi minute. Wings brownish-black, the following parts hyaline; a spot in apex of marginal cell, a larger spot in apex of first submarginal cell nearly as long as the second submarginal cell, a spot in centre of second submarginal cell extending nearly whole length of that cell, a streak in apex of first posterior cell, one in middle of second posterior cell, a spot in base and another in apex of third posterior cell, a spot near centre of fourth posterior cell and a large spot in apex of discal cell; veins between these hyaline parts bordered with brown; a lighter streak in middle of anal and another in middle of axillary cell; costal cell reddish; apical half of first basal cell reddish-yellow; vein between discal and third posterior cell much bowed downward, and emitting a stump of a vein which projects into the third posterior cell. Length 15 mm.

North Carolina!, Virginia, Georgia, Florida? A single specimen (Keen).

Additional Species.

Since sending the above to the publishers I have received the three following species from S. W. Williston:

52. **Anthrax effrena** n. sp.—Differs from *alpha* (No. 48) only as follows: proboscis not projecting beyond epistoma. Wings wholly dark brown, except a large hyaline spot near middle of discal cell encroaching on the third posterior cell, a less distinct spot in middle of fourth posterior cell and the entire apex of second submarginal cell; basal half of third vein and basal two-thirds of sixth vein light yellow. Length 12 mm.

Arizona! A single specimen.

53. **Anthrax arizonensis** n. sp.—Differs from *scitula* (No. 26) only as follows: Proboscis projecting length of its labellæ beyond epistoma; bristles of hind angles of thorax and of scutellum black; tomentum of abdominal segments 4–6 wholly black, of the last segment white; pile of segments 3–6 wholly black; venter and legs largely black tomentose; brown of wings extends from first vein a little beyond base of second transversely to middle of fifth vein, then slightly curving around to near apex of anal cell; whole of axillary cell hyaline, basal half of anal cell and nearly all of second basal cell whitish hyaline, costal cell and extreme base of wing bright yellow. Length 9 mm.

Arizona! A single specimen.

54. **Anthrax otiosa** n. sp.—Differs from *plagosa* (No. 41) only as follows: Epistoma slightly produced; proboscis not projecting beyond epistoma; first antennal joint yellowish, the third elongate-conical at its base; occiput white tomentose; bristles of thorax reddish; breast white pilose; scutellum reddish, the base black; sides of abdomen broadly reddish, pile of first two segments white. (Abdomen too much rubbed to give color of tomentum, but it appears to have been largely white) Brown of wings strongly curved outward through base of third posterior cell; root of second vein not bordered with subhyaline; venter reddish, white pilose; tomentum of legs largely white. Length 10 mm.

Arizona! A single specimen.

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Studies on the North American CHALCIDIDÆ, with descriptions of new species, chiefly from Florida.

BY WILLIAM H. ASHMEAD.
Jacksonville, Fla.

In the following pages I continue my studies on this family, give synonymical and other notes on various species, describe the new forms brought to my notice and correct many errors made in my earlier papers on the subject, all of which I hope will be found of interest and value to the student.

Subfamily CHALCIDINÆ.

SMICRA Spinola.

1. **Smicra flavopicta** Cress.

Two specimens of this species, which was originally described from Cuba, were taken on oak shrubs last summer; it is therefore to be added to our fauna.

2. **Smicra mendica** Cress.

This Mexican species was also taken here last summer and should therefore be added to our fauna.

3. **Smicra montana** n. sp.—♂ Length .25 inch. This species agrees in color and markings exactly with *Smicra ambigua* Cress., a Mexican species, excepting as follows: In place of "numerous minute black teeth" *there are but six*, the four middle ones being very long and large; the petiole of abdomen is black; the first abdominal segment and second, excepting along the basal suture, and oblong lateral blotches at tip of third, fourth and nearly the whole of the fifth segments, lemon-yellow. On the metathorax there are two deep, transverse foveæ separated only by a carina. The sculpture is very coarse.

Hab.—Asheville, N. C.

This interesting species was captured early one morning in October, while looking for cynipidous galls, resting on a leaf of the white oak; it had evidently been numbed by the frost the night previous, for I captured it in my fingers.

4. **Smicra carolina** n. sp.—♂ Length .35 inch. Head lemon-yellow, antennal groove and vertex, and space back of head, antennæ, excepting scape at base and a stripe beneath, and tips of mandibles, black. Collar, excepting humeral angles posteriorly, along parapsidal sutures, triangular blotch at base of wings, base of scapulæ, three small spots beneath wings, anterior edge of mesopleuræ, metapleuræ, spot on metathorax on each side of petiole, scutellum, ex-

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cepting small spot in centre, the petiole, the abdomen, excepting a V-shaped blotch at base and along anterior margin of first segment, base of third, and slightly along sutures of other segments, the four anterior legs, the posterior coxæ beneath, and the posterior femora, excepting teeth and a blotch on disk connected slightly along teeth with a small blotch at apex and base of tibiæ, lemon-yellow. The swollen femora are armed with rows of seven short, stout, conical teeth.

Hab.—Asheville, N. C.

This beautiful species approaches nearest to *Smicra Nortoni* Cress., and has a lemon-yellow line before each ocellus as in that species, but the lower margin of cheeks are not narrowly margined with black, the discal spot on scutellum is not large, the metathorax is black, and its apex is not yellow; the coxæ, the femora and abdomen are, too, differently colored, and there are only seven teeth.

I had confounded this species with *S. Nortoni*, but the characters pointed out will easily separate it.

CHALCIS Fabr.

5. **Chalcis pedalis** Cress.

A single specimen of this species was taken in beating net last summer. It agrees pretty well with Mr. Cresson's description, excepting its abdomen is not black, but dull rufous, and I have grave doubts as to its being that species.

6. **Chalcis ovata** Say.

A single specimen of this insect was bred last summer from the squash vine borer *Eudioptis hyalinata* Linn.

HALTICELLA Spinola.

7. **Halticella xanticles** Walker.

One specimen, captured last August, agrees perfectly with Mr. Walker's description for a transcript copy of which I am indebted to Mr. Samuel Henshaw, of the Boston Natural History Society, and I desire to express my thanks thus publicly to this gentleman, to Dr. George Dimmock, of Cambridge, and to Mr. E. T. Cresson of Philadelphia, for courtesies of a similar character.

The species also seems to agree with Mr. Howard's *Halticella americana*, the only real difference between the two descriptions, that I can find, is a slight one of size. The two are evidently identical.

8. **Halticella onatas** Walker.

I reared a single specimen of this species from the cynipidous oak gall *Dryophanta polita* Bassett, in March, 1886. It agrees perfectly

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with Mr. Walker's description, and is, I believe, the only species of the genus on record reared from an oak gall. It is easily recognized by its rufous colored legs.

9. **Halticella longicornis** n. sp.—♀. Length .16 inch. Black, coarsely but not confluently punctured and covered with a sparse white pile, this is fine and denser on the swollen femora and tibiæ. The antennæ is unusually long and slender, subclavate; the scape and legs are rufous, excepting the apical half of the swollen femora, which is black. The abdomen is shining black with whitish pile on the segments laterally; wings dusky hyaline.

Described from one specimen captured at large.

This species is near *H. onatas*, but the difference in the antennæ and the apical half of posterior femora easily distinguish it.

Subfamily TORYMINÆ.

LOCHITES Förster.

10. **Lochites punctata** n. sp.—♂. Length .10 inch. Opaque, granulately punctate and of a dull brownish color above and shining blue-black at sides and beneath. The face is finely punctate; antennæ robust, pubescent, with the joints distinctly separated, the scape rufous; the pedicel, which is rather small and the flagellum are darker; the two small ring joints which distinguishes this genus, are distinctly seen, thence there are eight joints, the first being a little longer than broad, the others about as broad as long and slightly pedicellated. The thorax has the peculiar punctuation common to the *Pireninæ*. The abdomen is subsessile, blue-black, slightly broadened behind, convex beneath, subconvex above. Legs, including trochanters, but not the coxæ, are rufous, the tibiæ paler than femora, all the tarsi are white. Wings hyaline, stigma not developed.

Described from one specimen taken at large.

MEGASTIGMA Dalman.

11. **Megastigma ficigerse** n. sp.—♂. Length .07 inch. Color: a uniform dark blue with a slight æneous reflection on thorax and abdomen. The antennæ are brown, tarsi white and clear hyaline. The abdomen is sessile, clavate, concave above, convex beneath, and the stigmal vein is developed and knobbed.

Described from one specimen bred in 1885 from cynipidous galls *Holcaspis ficigera* Ashm., and another from *Amphibolips femorata* Ashm., MS. in 1886.

12. **Megastigma cecidomyiæ** n. sp.—♂ and ♀. Length .05 to .08 inch. Ovip. .05 to .06 inch. Yellowish, with blue head and occasionally some greenish spots on abdomen and sometimes a green face. The wings are hyaline and the stigma is but slightly developed, about as in *Megastigma collaris* Boh., to which also it has some resemblance. One ♂ has the head, body and abdomen all blue

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with pale yellowish, almost white legs, excepting a brown stripe along upper edge of posterior tibiæ and tarsi; another has the sides of collar, tegulæ, coxæ and venter all pale yellowish. The antennal club is enlarged.

Described from six ♀ ♀ and two ♂ ♂, bred April, 1886, from an unnamed cecidomyious gall on *Baccharia halimifolia*.

13. **Megastigma canadensis** n. sp.—♂. Length .10 inch. Robust, scaly punctate and of a blue or bluish-green color. The head is large, broader than thorax; eyes and antennæ brown, the latter rather long and slender, pubescent. Legs yellowish white, all the femora, excepting at tips, brown or greenish. The abdomen dull metallic green. The wings are hyaline, the stigmal vein unusully long, extending to the middle of the wing and knobbed.

Described from one specimen sent me by Mr. Wm. Brodie, of Toronto, Canada, and reared by him from oak gall *Biorhiza forticornis* Walsh.

DIOMORUS Walker.

14. **Diomorus biorhizæ** n. sp.—♀. Length .10 inch. Ovip. .11 inch. Dull, coppery-green, finely wrinkled and punctate, with some distinct, larger, coarser punctures. The antennæ, excepting the extreme base of scape, are black, and the joints of the flagellum are very closely united. The abdomen is dark green, with the basal abdominal flap excised in the middle. The legs are green, excepting tips of tibiæ and tarsi, which are white; the posterior coxæ are very coarsely punctate, and the femora have a distinct tooth beneath near apex. The wings are hyaline with brown veins; there is a slight dusky streak beneath stigma.

Hab.—Toronto, Canada. Described from one specimen bred from gall *Biorhiza forticornis* Walsh, and sent me by Mr. Wm. Brodie.

OLIGOSTHENUS Förster.

15. **Oligosthenus stigma** Fabr.

Syn. *Monodontomerus viridæneus* Prov.

In Petite Faune Entomologique du Canada, vol. ii, p. 569, M. L'Abbe Provancher has redescribed this well-known European species. It is parasitic on the Bedeguar rose gall *Rhodites rosæ* Linn., a gall now found plentifully on both continents; it was probably imported along with its host. Its synonyms are as follows:

Ichneumon stigma Fabr., Ent. Syst. ii, 1793, p. 188.
Deplolepis stigma Fabr., Sys. Piez. 1804, p. 152.
Cinips stigma Fonsc., Ann. Sc. Nat. xxvi, 1852, p. 289.
Callimome stigma Walk., Ent. Mag. i, 1833, p. 139.
Monodontomerus stigma Walk., Ent. Mag. ii, 1835, p. 158.
Torymus ater Nees, Hym. Ich. aff. Mon. ii, 1834, p. 69.
Glyphomerus (*Oligosthenus*) *stigma* Först., Hym. Stud. ii, 1856, p. 44.
Monodontomerus viridæneus Prov., Petite Faun. Ent, du Canada, ii, 1883, p. 569.

It is the only representative of this genus known to our fauna.

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SYNTOMASPIS Förster.

16. **Syntomaspis Lissus** Walker.
17. **Syntomaspis Theon** Walker.

These two species were described by Mr. Walker under the old genus *Callimome;* they belong properly to *Syntomaspis.*

To this genus also belong my *Callimome racemariæ, C. melanoceræ, C. citriformis, C. æneus, C. elegantissima* and *C. dryorhizoxeni.*

18. **Syntomaspis advena** O. S.

This species has been recognized from specimens sent me by Mr. Brodie bred from gall *Andricus petiolicola* and *Andricus ventricosus* Bass. It was also described as a *Callimome.*

19. **Syntomaspis tubicola** O. S.

I have reared several specimens of this species from gall *Andricus flocci* Walsh; it was described as a *Callimome* from oak gall *Andricus tubicola* O. S. I have reared it also from *Andricus flocci* Walsh.

20. **Syntomaspis Brodiei** n. sp.—♂ ♀. Length .13-.15 inch. Ovip. .12 inch. Differs principally from *Syntomaspis tubicola* O. S., in its much larger size, and in having tips of femora and tibiæ and tarsi yellowish; the trochanters are occasionally yellow, and the color of the thighs vary from a green to bluish-green; the pleuræ and hind coxæ are also blue; the tarsi are paler than the tibiæ. The ♂ has the collar, pleuræ, pectus and thighs blue and a bluish-green abdomen.

Hab.—Toronto, Canada. Described from three specimens sent by Mr. Wm. Brodie, of Toronto, Canada, and reared by him from the cynipidous gall *Acraspis pezomachoides* O. S.

21. **Syntomaspis dryophantæ** n. sp.—♀. Length .11 inch. Ovip. .08 inch. This species resembles *Syntomaspis tubicola* O. S., but differs from it in its much more compressed abdomen, finely, confluently punctured thorax, and red legs and white tarsi. The metapleuræ are violet and contrast most beautifully with the surrounding metallic green of the metathorax, mesopleuræ and coxæ.

Described from one specimen bred July, 1886, from cynipidous gall *Dryophanta catesbœi* Ashm.

22. **Syntomaspis albihirta** n. sp.—♀. Length .10 inch. Ovip. .03 inch. A short, robust, opaque, dull greenish-blue, granulate punctate species, and covered with short white hairs, more especially on abdomen. The antennal scape is brown, and the flagellum is brown-black. The legs are rufous, with the anterior and middle femora slightly infuscated, posterior pair bluish, the tips of tarsi brown. The abdomen is broad, submetallic green-blue, with the first abdominal flap excised in the middle, while the ovipositor is short and stout.

Described from one specimen taken at large, and very distinct from any other in our fauna.

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TORYMUS Dalman.

23. **Torymus bedeguaris** Linn.
Syn. *Callimome magnifica* O. S.

Baron Osten Sacken described his *Callimome magnifica* from specimens furnished him by Mr. Edward Norton, reared from rose galls. I had identified his species from specimens reared from rose galls *Rhodites carolina* A. and *R. rosæ* L., but was surprised on receiving specimens of *Torymus bedeguaris* Linn., from Europe, to find them identical. The species varies from a golden-green to bluish-green in the females, and to a greenish-blue in the males. It has been unquestionably imported to this country on *Rhodites rosæ* along with *Oligosthenus stigma* Fabr.

To this genus also belong my *Callimome cærulea*, *C. lividus* and *C. virentis*.

24. **Torymus flavicoxa** O. S.

One specimen, or rather what I take to be this species was reared from the root oak gall *Belonocnema Treatæ* Mayr.

25. **Torymus brevicauda** O. S.
Syn. *Callimome brevissimicauda* Ashm.

Numerous specimens of this species reared from two blackberry galls *Diastrophus nebulosus* O. S. and *D. cuscutæformis* O. S., convince me that my *Callimome brevissimicauda* is but a variety of this species. The length of the ovipositor and the color of the abdomen is variable.

26. **Torymus omnivoræ** n. sp.—♂ ♀. Length .07 to .12 inch. This species varies from a bluish or greenish-blue in the males to a greenish æneous or dull metallic green in the females. The punctuation is as in *Syntomaspis tubicola* O. S., and as in that species the tarsi are white, all the femora and tibiæ being green or bluish-green, excepting occasionally the tibiæ are brown, or tips white or yellowish. It could not be confounded with *S. tubicola*, as it is not so bright a green as that species, and *the scutellum has no transverse groove.*

Described from numerous specimens reared 1886 from cynipidous gall *Holcaspis omnivora* Ashm.

27. **Torymus neuroterus** n. sp.—♂. Length .05 inch. A diminutive, metallic-green, little species, with a large, transverse head, black antennæ, blue or violet colored metathorax and abdomen and metallic-green legs, the trochanters, tips of tibiæ, and tarsi alone being white. The abdomen is pedunculate.

Described from specimens bred 1886 from gall *Neuroterus minutissimus* Ashm.

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28. **Torymus anthomyiæ** n. sp.—♀. Length .07 inch. Ovip. .05 inch. This is another short, robust, metallic-green species, closely resembling *Syntomaspis tubicola* O. S., and difficult to distinguish from it. In color it is exactly the same, excepting the femora at tips, and the tibiæ and tarsi are pale yellowish; the ovipositor is shorter and stouter and the abdomen is pubescent. These characters will also distinguish it from *Torymus omnivoræ* m.

Described from two specimens taken on a cultivated plant, the leaves of which were mined by an anthomyid larva which I have good reasons for suspecting is parasitized by this species.

ORMYRUS Westwood.

29. **Ormyrus vacciniicola** n. sp.—♀. Length .10 to .12 inch. Blue-black, with a slight metallic lustre and the thorax almost devoid of the peculiar, fine, wrinkled sculpture, so characteristic of this genus. The head is finely transversely rugulose; the antennæ dark brown, scape rufous; the legs pale brown with a reddish cast, the posterior femora being slightly infuscated above, all coxæ brown, excepting the posterior ones at base. The abdomen is much compressed, brown, with a metallic lustre, a row of long white hairs on each segment, excepting the basal one, and the tip is prolonged into a slender point. The wings are hyaline and the veins brown.

Hab.—Toronto, Canada. Described from three specimens sent by Mr. Wm. Brodie, and reared from the cynipidous gall *Solenozopheria vaccinii* Ashm.

The compressed abdomen and its color will separate this species from the others in our fauna.

30. **Ormyrus ventricosus** n. sp.—♂. Length .15 inch. A robust form of a uniform æneous-green or dark greenish-blue color including the legs and the antennal scape. The abdomen is bluish-green above; the anterior tarsal joints are streaked above with brown and the four terminal joints of the middle legs are brown, the basal joint being yellowish-white, or sometimes all the tarsal joints are whitish and the legs greenish-blue.

Hab.—Toronto, Canada. Described from specimens reared from *Andricus ventricosus* B., and an undescribed oak gall sent by Mr. Brodie.

31. **Ormyrus minutus** n. sp.—♂ ♀. Length .04 to .08 inch. Color ranging from metallic-blue through greenish-blue to bluish-green, with rufous legs; the femora are generally green or blue, sometimes brown, the posterior ones being much thickened, sometimes all the femora are rufous, the same color as the tibiæ; sometimes only the posterior femora will be green or blue, and sometimes the tibiæ, especially the posterior pair, will be rufous; one ♂ has uniform brownish-yellow legs.

Described from numerous specimens reared from oak gall *Neuroterus laurifoliæ* Ashm.

Like *Ormyrus labotus* Walker, it is very variable, but the thickened thighs will readily distinguish it.

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Subfamily EUPELMINÆ.

EUPELMUS Dalman.

32. **Eupelmus redmvii** Howard.

Several specimens of an Eupelmid which I take to be this species were reared last summer from the eggs of the common squash bug *Anasa tristis* DeG.

33. **Eupelmus quercus** Ashm.

A single specimen of this species was reared this January from oak gall *Holcaspis ficigeræ* Ashm.

Subfamily ENCYRTINÆ.

CERAPTEROCERUS Westwood.

34. **Cerapterocerus floridanus** n. sp.—♂. Length .08 inch. Blue-black, the scutellum plumbeus. The head is oblong, flat; eyes large, prominent, long-oval, occupying at least two-thirds the length of the long head; the antennæ, including the scape and the flagellum, are broadly widened or dilated, pubescent, they issue just above the mouth; the scape has an æneous or greenish lustre in different lights; the flagellum is brown black. The legs are pale yellowish with the middle and posterior femora infuscated and the posterior tibiæ at tips are also dusky. The wings are clear hyaline, with a rather long marginal vein.

Described from a single specimen captured at large in April, 1884. This is an interesting addition to our fauna, being the first of the genus to be described in N. A. and is very distinct from the two European species *C. mirabilis* Westw. and *C. corniger* Walker.

HOMALOTYLUS Mayr.

35. **Homalotylus similis** n. sp.—Differs from *Homalotylus obscurus* Howard, in having all the tarsi white, excepting the apical tarsal joints of the posterior legs. The inner margins of the eyes are covered with a short, dense, silvery pubescence; the thorax is also sparsely pubescent. The scutellum is brown, *not dead black*. The metapleuræ are densely pubescent and the abdomen has a greenish lustre.

Described from one specimen bred in August, 1886, from pupa of *Scymnus cervicalis*.

Mr. Howard's species was bred from the larva of *Cycloneda sanguinea*. My *Homalotylus lachni*, bred from an Aphis, *Lachnus australis* Ashm., I think, does not belong to this genus, but to the genus *Phænodiscus* Först.

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To this genus also belongs *Eutelus scymnæ* Shimer, described as a Pteromalid, *vide* Trans. Am. Ent. Soc. vol. ii, p. 385. It will be found to be very close to *H. obscurus* How.

LEPTOMASTIX Förster.

36. **Leptomastix tineævora** n. sp.—♀. Length .08 inch. Reddish-brown, eyes, scutellum and flagellum, darker. The antennal scape is very long and slender as well as the flagellum; the thorax shining; the mesopleuræ are violaceous, and the abdomen at base above is metallic-green, metathorax and legs pale brown; the posterior femora above and the tibiæ, apical two-thirds dusky. The wings are hyaline, with a dusky blotch the width of the marginal vein, which is long and thick, the stigmal vein being very short; the margins of wings are fringed with short ciliæ.

Described from one specimen bred 1886, from a Tineid larva mining in wooly galls *Andricus Pattoni* Bass. It is very distinct from *Leptomastix dactylopii* Howard.

ENCYRTUS Dalman.

37. **Encyrtus inquisitor** Howard.

A single specimen of this species was taken on a Coccid *Lecanium* sp on Pine.

38. **Encyrtus solus** Howard.

One specimen, evidently this species, was reared from *Trioza magnoliæ* Ashm. The wings were dusky; Mr. Howard says nothing about wing characters in his description.

39. **Encyrtus sublestus** Howard.

A male and female of this species were reared from a Coccid *Lecanium* sp occurring on *Pinus australis* last summer.

40. **Encyrtus mesograptæ** Ashm.

Numerous specimens of this species were reared in my work for the Department of Agriculture last summer from the pupæ of the syrphid fly *Mesograpta polita* Say. It is very closely related to *E. sublestus* Howard.

41. **Encyrtus aphidiphagus** Ashm.

Numerous specimens of this species were reared from the cabbage Aphis, *Aphis brassicæ* Linn., last summer.

42. **Encyrtus 4-maculatæ** Ashm.

This species was described as a *Pteromalus;* it is very close to *E. sublestus* and *E. mesograptæ* Ashm., but probably distinct. My types are in poor condition and the species was very imperfectly character-

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ized in the "Canadian Entomologist" some years ago when I began my entomological studies and knew comparatively nothing of the enormous work accomplished by hosts of learned students. I can see now that my earlier work is of but comparatively little value.

Subfamily PTEROMALINÆ.

Tribe MISCHOGASTRIDES.

MEGORISMUS Walker.

43. **Megorismus nubilipennis** n. sp.—♀. Length .11 inch. Broad, robust, shining blue-black, almost devoid of sculpture. The antennal scape and legs reddish-brown, the posterior femora infuscated, in one specimen slightly bluish, the tarsi pale. The wings are hyaline, with a large brown blotch enclosing marginal vein and stigma; veins brown; the marginal vein about twice the length of the stigmal, the knob of the stigmal vein is toothed and the submarginal vein is interrupted by a pale ring at the juncture with the marginal vein. The abdomen is broad and flattened.

Hab.—Toronto, Canada. Described from three ♀ specimens sent me by Mr. Wm. Brodie, of Toronto, Canada, and bred by him from the cynipidous gall *Solenozopheria vaccinii* Ashm.

I have also reared hundreds of the same species from the same gall in Florida.

HALTICOPTERA Spinola.

44. **Halticoptera Brodiei** n. sp.—♀. Length .10 to .12 inch. Metallic greenish-blue; the face more or less green; the antennæ are brown, the scape and the legs pale brown or yellowish-brown. The thorax is granulately punctate without parapsidal grooves; the collar is very short, visible from above only as a sharp ridge. The sessile abdomen is long, pointed, ovate and is slightly brassy above at base. The wings are clear hyaline with pale yellowish veins, the marginal and postmarginal veins both long, the stigmal ending in a small knob and two-thirds the length of the postmarginal.

Hab.—Toronto, Canada. Described from three specimens reared by Mr. Wm. Brodie from the oak gall *Biorhiza forticornis* Walsh.

Tribe CLEONYMIDES.

TRIGONODERUS Westwood.

45. **Trigonoderus aegeriæ** n. sp.—♀. Length .12 inch. A brilliant golden-green, coarsely punctate species, with a large, somewhat triangular head, distinct parapsides and subsessile, flattened, rounded abdomen. The antennæ are placed slightly below the middle of the face rather slender, subclavate, with a black pedicel, markedly contrasting with the brown scape and flagellum. The scutellum has a deep, transverse groove near its tip, and is convexly rounded; the legs yellowish. The wings are hyaline, veins brown; the marginal vein is not particularly long, about the same length as the postmarginal.

A very handsome species taken on the leaf of a squash vine and supposed to be parasitic on *Melittia ceto* Westw., which was found boring into and destroying the vine.

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Tribe SPHEGIGASTRIDES.

PACHYCREPIS Forster.

46. **Pachycrepis lachni** n. sp.—♀. Length .09 inch. A brilliant golden green, somewhat transversely sculptured species with violet reflections. The posterior coxæ are blue, the legs pale yellow, excepting a greenish or brown blotch on middle of posterior thighs. The color, differently colored legs, and its larger size will readily distinguish it from *Pachycrepis mesograptæ* Ashm.

Described from three specimens reared from pine aphis *Lachnus australi* Ashm.

47. **Pachycrepis mesograptæ** Ashm.

This species was reared last summer from syrphid pupæ *Mesograpta polita* Say.

PACHYNEURON Walker.

48. **Pachyneuron syrphi** Ashm.

This species is my *Spalangia? syrphi* reared from a syrphid pupa *Syrphus philadelphicus*, and described some years ago in the "Canadian Entomologist." I gave the same name to another species last summer, but which is evidently distinct; that may be known as *syrphicola*.

Subfamily PERILAMPINÆ.

LAMPROSTYLUS Förster.

49. **Lamprostylus (?) floridanus** n. sp.—♂. Length .11 inch. Black, opaque, coarsely and deeply punctate, the face covered with white pubescence. The antennæ in structure is similar to the males in *Eurytoma* with whorls of long, white hairs. Eyes brown, scutellum large, elevated posteriorly. Wings hyaline, short, at apex full and round; the marginal vein is short, stout, the stigmal vein short. The abdomen is ovate, all the dorsal segments plainly visible, and nearly equal in length, the two ventral segments overlapping the two dorsal segments at sides, and is attached to the stout peduncle, apparently from the side, the butt end appearing above, the pointed end beneath, or like an egg standing on its point. All the femora, excepting at their tips, and the middle and posterior tibiæ, excepting tips, black; rest white.

Described from one specimen captured at large.

This interesting species shows very close affinity with the *Eurytominæ*, and will help to bridge the barrier separating these closely related subfamilies.

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Subfamily EURYTOMINÆ.

EURYTOMA Illiger.

50. **Eurytoma gigantea** Walsh.

Syn. *Callimome Duckeri* Brodie.
Ormyrus elongatus Prov.

Four specimens of this interesting Eurytomid were identified from specimens sent to me by Mr. Wm. Brodie and reared from a dipterous gall *Eurosta solidaginis*. He informs me it is his *Callimome Duckeri* and *Ormyrus prolongatus* Prov. It varies greatly in size from .12 to .25 of an inch, but is known at once by its "compressed abdomen, unusually long and acutely porrect ventral valve and 9-jointed antennæ."

The male, which was unknown to Walsh, has also antennæ of distinctly 9-joints, which will at once separate it from all other known Eurytomid males in our fauna, but its abdomen is also compressed, very high dorsally and acutely emarginate at tip beneath, giving it a very peculiar shape.

51. **Eurytomus abnormicornis** Walsh.

A single specimen of this insect was captured at large here last summer. It is at once known by the abnormally lengthened third antennal joint.

52. **Eurytoma auriceps** Walsh.

Six specimens of this species were reared last summer from gall *Andricus rugosus* Ashm. It is easily distinguished by the dense, golden pubescence of the face.

53. **Eurytoma prunicola** Walsh.

This species varies greatly in the color of the abdomen; it has been reared from various galls.

54. **Eurytoma diastrophi** Walsh.

This species has been reared from *Diastrophus nebulosus* O. S., and *D. cuscutæformis* O. S. It seems to be a very distinct and constant species, although somewhat related to *E. prunicola*, but the abdomen is proportionally longer and not so broad vertically.

Dr. Mayr has given the same name to a European species in his "Arten der Chalcidier-Gattung Eurytoma durch Zacht erhalten," that species is also in my collection, but very distinct; and, as Mr. Walsh has priority, I propose the name *Eurytoma Mayri* for the European species.

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55. **Eurytoma studiosa** Say.

Syn. *Eurytoma lanulæ* Fitch.
Eurytoma phytes Walk.
Eurytoma teredon Walk.
? *Eurytoma Bolteri* Riley.

I have followed Walsh in considering *Eurytoma Bolteri* Riley, synonymous with this species, but it seems to be a much larger and distinct species, and I am inclined to believe it distinct, but cannot surely tell without seeing specimens. Mr. Howard's *Eurytoma funebris* seems also to be closely related to *studiosa;* I can find no character in his description to separate them. Mr. Walker's description of *E. phytes* and *E. teredon* agree, and Dr. Fitch's *E. lanulæ* is certainly *studiosa*, for I have reared it from the same oak gall from which his type came, and besides his description can only apply to this species. I have reared it from several galls.

56. **Eurytoma maculipes** Ashm.

This species was described by me as a *Decatoma;* it is a much more slender form than *E. studiosa*, the abdomen is twice as long as thick through vertically and the ventral valve is not prolonged to a point. Two specimens agreeing very closely with my type were received from Canada.

57. **Eurytoma californica** n. sp.—♂ ♀. Length .12 to .20 inch. Black, robust, similar in form to *Eurytoma obtusiloba* Ashm. Like *E. auriceps* Walsh, the face is covered with a golden pubescence, becoming in the female a dirty white, or white on the thorax and abdomen, in the males brownish; the abdomen, too, is similar to that species in shape, but the fifth and following segments are fringed with white hairs, and all the femora in the middle and all the tibiæ, excepting sometimes the anterior pair are brown or black in the middle. The posterior coxæ are always black, but the others are generally brown. The antennæ in the female are 9-jointed; in the males but 8-jointed, the 9th not being distinctly separated, the first flagellar joint is very large and broad, and the others are gradually narrowed, with whorls of long hairs, the terminal joint is equal in length with the third. The wings are hyaline, the veins thick and of a brown color; the stigmal vein is short, about half the length of the marginal vein.

Hab.—Los Angeles, California. Described from several specimens reared from the oak gall *Andricus pomiformis* Bass.

This species could only be confounded with *E. auriceps* Walsh, but its large size, color of the legs and antennal characters will at once separate it.

58. **Eurytoma sculpta** n. sp.—♀. Length .12 inch. In this species the abdomen is short, stout, not compressed or but slightly, nearly as broad vertically or when viewed from the side as long, with ventral valve pointed and long, the whole surface is sculptured and the fifth at sides and following segments pubescent. The posterior femora are brown or black.

Described from four specimens. This species approaches nearest to *Eurytoma punctiventris* Walsh.

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59. **Eurytoma solenozopheriæ** n. sp.—♂ ♀. Length .08 to .10 inch. Black, less coarsely punctured than usual, face and thorax covered with a silvery gray pubescence. In shape it somewhat resembles *E. studiosa* Say, but the black, polished abdomen is much more compressed, and the projecting valves longer, and its tip is only slightly pubescent. The antennæ are brown-black, excepting scape at base, which is pale; in outline the antennæ are subclavate, 8-jointed, the joints of club not distinctly separable, the joints of flagellum are rounded, the first being slightly longer than broad. The legs are brownish-yellow, the posterior femora brown or black, excepting tips and a brown line on anterior and middle pairs, and on all the tibiæ, excepting the anterior pair in the male. The peduncle of the male is very long, as long as the anterior femora.

Hab.—Toronto, Canada. Described from specimens sent me by Mr. Wm. Brodie, and reared from the cynipidous gall *Solenozopheria vaccinii* Ashm.

Its finer punctured surface, denser pubescence, large peduncle in the ♂, differently colored antennæ and legs, will readily distinguish it from *E. studiosa* Say, to which it shows affinity.

DECATOMA Spinola.

60. **Decatoma querci-lanæ** Fitch.
Syn. *Spalangia querci-lanæ* Fitch.
Decatoma hyalipennis Walsh.
Var. *Spalangia dorsalis* Fitch.
Decatoma simplicistigma Walsh.

Dr. Fitch, in his "Fifth Report on Noxious and other Insects of New York" described a chalcid reared from his oak gall *Cynips lanæ* = *Andricus flocci* Walsh, which he called *Spalangia querci-lanæ* and a variety of it *dorsalis*, which I am satisfied is nothing but a *Decatoma*, as from this same gall I have reared nothing but *Decatomæ*, two varieties agreeing in all particulars with this so called *Spalangia*, and which I shall show were afterwards described by Mr. Walsh as two distinct species, reared from galls on the white oak.

Let us compare descriptions in parallel columns:

Spalangia querci-lanæ Fitch	**Decatoma hyalipennis** Walsh.
Length .08 to .10 inch.	Length ♂ .08 inch.
Black, with the face, antennæ, sides of collar, whitish or greenish-yellow. Its cubital head, which is about as long as wide indicates its relationship to *Spalangia, though in some respects it does not appear to fully coincide with the characters assigned to this genus.* The abdomen is smooth and polished, its underside of a *tawny red color*, and is separated from the thorax by a pedicel.	♂. Black. Head subopaque, confluently and very coarsely punctate; orbits, narrowly interrupted above; the face below the antennæ, cheeks and mouth pale yellow. Antennæ dull yellow. Collar pale yellow, except a wide dorsal vitta. Wing scale and a longitudinal line above it, pale rufous. Abdomen highly polished, *piceous* below. Peduncle two-thirds as long as rest of abdomen.
Legs whitish or greenish-yellow. *Some individuals have the upper side of the hind thighs* and of the first joint of the antennæ, *black*.	Legs pale yellow, basal two-thirds of the head, coxæ and a *patch above on the middle of the hind femora, black.*

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The stigma of its forewing is a semicircular, *black*, shining spot with a small appendage on the inner side of its hind end and its base slightly separated from the robust subvein, which vein is of a *dark* or black color.

Spalangia dorsalis Fitch.

Specimens frequently occur so very different in their colors that they might be deemed a distinct species. They may be termed the line-backed variety *dorsalis* of the oak wool parasite. In them the thorax is pale greenish-yellow with a black stripe along its middle, and the abdomen is yellow, with the back black, and commonly with black bands upon its sides.

Wings hyaline; veins brown; *stigma black*. No vestige, whatever, of any stigmatic cloud or patch.

Decatoma simplicistigma Walsh.—♂ ♀. Pale ochre yellow. Head subopaque, confluently and very coarsely punctate; disk of the occiput, ocelli and which is rarely (1 ♂ 1 ♀) confluent by a narrow tongue with the occipital spot, all black. Antennæ with the flagellum slightly obfuscated above. Thorax sculptured as the head, but still more coarsely. Collar rarely (1 ♀) with a narrow dorsal black line; mesonotum with a more or less slender dorsal black triangle, the base of the triangle usually starting from the suture behind the collar, sometimes from the hind part of the collar, and the apex of the triangle approaching more or less nearly, but never quite attaining the scutel. Occasionally on each side of this black triangle two or three black dots are placed in the suture behind the collar. On the scutel a more or less wide dorsal black line not quite attaining its tip. Very rarely (1 ♀) the entire mesonotus is immaculate, mesothorax always with a more or less wide dorsal black line, which is almost always proloned in a curve behind the mesothoracic scutel to the origin of the front wing. Abdomen highly polished, with the peduncle ♂ ♀ as in *varians*, the yellow color often merging more or less into rufous. Peduncle above and below, a dorsal, a dorsal line not attaining the tip, which generally expands upon each suture into a lateral tooth, and is sometimes dilated into one large dorsal patch, all black. Legs immaculate, but the suture at the origin of the hind coxæ is black. Wings hyaline; veing brown; stigma black; no vestige of any stigmatic cloud or patch. Length ♂ .06-.11 inch, ♀ .08 .11 inch.

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Mr. Walsh's descriptions are very full and accurate, but I think a comparison with Dr. Fitch's will convince any reasonable person that all these species are the same; in my mind there is no doubt, for I have reared the species from the same galls as Dr. Fitch and Mr. Walsh, and from many other galls, and the species cannot be separated. It is a very variable species.

61. **Decatoma varians** Walsh.

This is also an extremely variable species, occurring in various galls, but may always be distinguished from *D. querci-lanæ* by having a distinct stigmatic cloud. Very many others of the so called species in this genus will probably have to be placed as varieties here.

62. **Decatoma nubilistigma** Walsh.

Mr. Brodie has sent me three specimens of *Decatomæ* reared by him from *Solenozopheria vaccinii* Ashm., which cannot be separated from this species.

ISOSOMA Walker.

63. **Isosoma hordei** Harris.
Syn. *Decatoma basilaris* Prov.

L'Abbe Provancher's type of this species was sent to me along with other chalcids, but it would hardly have been necessary to see type to correct the synonym, for besides his description agreeing with *hordei* in speaking of the ♂ he says: "Les antennæ ornees de verticelles de longs poils blancs." The ♂ antennæ in *Decatoma* are always simple, same as the ♀.

This species is very closely related to the European species *Isosoma graminis* Giraud. As. Mr. Walsh has shown it varies greatly in the color of the legs.

In my *Isosoma gigantea* rather inappropriately named, for it is by no means as large as many others in the genus, the stigmal vein is distinctly *longer than the marginal vein*, a character laid down in Mr. Howard's excellent "generic synopsis" for the genus *Systole* Walk., but the metathorax is gradually sloping, and in shape, etc., it does not differ from typical *Isosomæ*.

Subfamily TRIDYMINÆ.

METASTENUS Walker.

64. **Metastenus (?) acanthocini** n. sp.—♂ ♀. Length .15 to .25 inch. Black, opaque, coarsely granulately punctate, and sparsely covered with short white hairs. The head is rather broad, with antennal depression; eyes brown;

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antennæ 10-jointed, inserted on middle of face, rather slender, scape long, pale brown, flagellum black, or brown-black, with two ring joints. The parapsides are obsolete. The abdomen is sessile, and in the female very long and acuminate, projecting considerably beyond the tips of the wings when they are folded over the back; it has a metallic lustre. The legs are pale yellowish-brown with the femora dark brown. Wings hyaline; veins brown, the marginal twice as long as the stigmal, the latter clavate; the postmarginal is slightly longer than the stigmal. The male is very much smaller than the female, with a short ovate abdomen and dull rufous antennæ, and I can detect but one ring joint.

This rare and curious species is described from ten individuals reared from the larva of a beetle *Acanthocinus obsoletus* Oliv., which is found boring into pine, and I have reared in all its stages.

Eighteen of the chalcid larvæ issued from a single larva of the beetle and transformed, without spinning cocoons, into pupæ; these I placed in a separate box with some loose mold. In three or four days (I watched them every day) I noticed they began to show signs of drying up on account of the mold becoming dry, so from that day for three weeks I sprinkled, twice a day, a few drops of water over them and kept them in as moist and healthy a condition as possible.

On the eighteenth day my labor was rewarded with my first fly, and for some days afterwards with others and I succeeded in rearing ten perfect specimens from eighteen pupæ.

Subfamily SPALANGINÆ.

SPALANGIA Latreille.

65. **Spalangia drosophilæ** n. sp.—♀. Length .08 inch. Blue-black, shining. The oblong, flattened head is covered with coarse, *distant* punctures, with a longitudinal median groove and a triangular projection at tip, sparsely pubescent. The 10-jointed antennæ issue from the extreme tip of the head; the prothorax is elongated; the scutellum has a transverse row of punctures posteriorly near the tip; on the metathorax are two lateral longitudinal grooves and on its disk a double row of coarse punctures confluent behind; the abdominal petiole is moderately long; the legs are clavate, black, pubescent, with pale or reddish tarsi; the wings are hyaline, with a rather long marginal and a short curved stigmal vein.

Described from one specimen bred from the larva of a Dipteron *Drosophila* species.

This species seems to agree very closely with the Proctotrupid genus *Synarsis* Förster.

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Subfamily ELACHISTINÆ.

EUPLECTRUS Westwood.

66. **Euplectrus leucotrophis** Howard.

A single specimen of this species was reared from an unknown noctuid larva.

67. **Euplectrus Comstockii** Howard.

Twelve specimens of this species were reared from an unknown larva last summer; the whole interior of the larva was honey-combed with their cocoons, the dorsal skin being held over them by silken threads.

STENOMESIUS Westwood.

68. **Stenomesius harrisinæ** n. sp.—♀. Length .10 inch. Head, antennæ, legs, thorax and abdomen honey-yellow, joints of flagellum dusky. Thorax rugose, with golden-brown and yellowish; the collar somewhat conical rounded before; parapsides distinct; the scutellum is rugose and has two parallel grooves on its disk, and is of a decided gold-brown. The abdomen is ovate, peduncu:ate, and infuscated with brown. The wings are hyaline; veins brown. the marginal vein very long.

Described from one specimen bred last summer from the pupa of *Harrisina Americana* Harris.

Subfamily EUTEDONINÆ.

ASTICHUS Forster.

69. **Astichus auratus** n. sp.—♀. Length .05 inch. Head and thorax bright golden-green, scaly; eyes brown. Antennæ blue-black with whorls of long hairs, the scape yellowish. The abdomen is oval, with a short peduncle, and is bluish or cupreous. The legs are honey-yellow, with the femora dusky or brown. Wings hyaline, ciliated, with yellowish veins; the stigmal vein is short, knobbed, and there is no postmarginal.

Described from three specimens reared from oak gall *Neuroterus minutissimus* Ashm.

HOLCOPELTE Förster.

70. **Holcopelte flavipes** Ashm.
Syn. *Elachistus flavipes* Ashm.

This species was described in my last paper under the genus *Elachistus*, but belongs, as my description plainly shows, "scutellum with a median longitudinal groove" here.

71. **Holcopelte violacea** n. sp.—♀. Length .08 to .09 inch. In statue this species is similar to *H. flavipes;* smooth, but of a uniform violet color, and only slight cupreous reflections on head, scapulæ and base of abdomen. The

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legs are pale, almost white, with antennæ, excepting scape, black. The wings are hyaline, and the marginal vein very long, occupying two-thirds the length of the wing, the stigmal vein a mere dot. The scutellum has but one groove down its centre.

Described from three specimens reared from a Tineid larva living in the wooly galls of *Andricus flocci* Walsh. These two species are the only ones known in this country.

ENTEDON Dalman.

72. **Entedon diastatæ** Howard.

Several specimens of this species were reared from a dipterous leaf-mining fly *Diastata* sp. mining in corn leaves; last summer.

73. **Entedon Herillus** Walker.

Several specimens of an *Entedon* agreeing almost exactly with Mr. Walker's description of this species in Ann. Mag. Nat. Hist. vol. xx, p. 23, were reared by me last summer from the pupa of *Desmia maculalis* Westw.

74. **Entedon aphidiphagus** n. sp.—♀. Length .08 inch. Head, thorax, scutellum, metathorax and metapleuræ, cupreous, rest of the body blue-black, although there is a slight metallic lustre to the abdomen above, and in one specimen slightly to the legs. The tarsi are white: wings hyaline.

Described from two specimens reared from the orange aphis *Siphonophora citrifolii* Ashm. It seems to be very distinct from all the others in our fauna and easily recognized.

Subfamily EULOPHINÆ.

SYMPIESIS Forster.

75. **Sympiesis flavipes** Ashm.

Three additional specimens of this species were reared last summer from a rose gall. The type was taken at large.

Subfamily TETRASTICHINÆ.

EUDERUS Haliday.

76. **Euderus elongatus** n. sp.—♀. Length .09 inch. Slender, elongate, blue-black, with dull metallic green, scaly thorax and scutellum. The vertex of head is transversely acute and the front deeply grooved for the reception of the antennæ. The antennæ (8-jointed?) dark brown, scape pale. The parapsides very distinct; tips of tibiæ and tarsi white, excepting the last apical tarsal joints, which are brown. The abdomen is sessile, elongate-ovate and blue-black. Wings hyaline; veins yellowish.

Described from one specimen.

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CERANISUS Walker.

77. **Ceranisus flavipes** Ashm.
Syn. *Tetrastichus flavipes* Ashm.

This species was described by me under the genus *Tetrastichus;* it was reared from oak gall *Holcaspis ficigera* Ashm.

78. **Ceranisus flaviceps** Ashm.
Syn. *Tetrastichus flavipes* Ashm.

This was also described as a *Tetrastichus.*

79. **Ceranisus lecanii** Ashm.
Syn. *Tetrastichus lecanii* Ashm.

This species was reared from a coccid *Lecanium* species and described by me under the old genus *Tetrastichus.*

80. **Ceranisus flavopictus** n. sp.—♂ ♀.—Length .07 inch. The male is almost entirely yellow, with eyes, blotch on mesonotum, sides of scutellum and tips of abdomen above, brown. In all these species the grooves are as in genus *Tetrastichus.* The scape is slightly dilated and grooved, flagellum with long hairs, antennæ apparently 9-jointed. Wings hyaline, ciliated. In the female the antennæ are clubbed, shorter, and without long hairs on flagellum: there is a brown blotch on fore part of the collar and the whole abdomen is brown.

Described from two specimens captured at large.

BARYSCAPUS Förster.

81. **Baryscapus centricolæ** n. sp.—♀. Length .12 to .14 inch. A large black species with a slight metallic lustre. This does not differ greatly from species in genus *Tetrastichus,* excepting the antennæ is 8-jointed (scape, pedicel, 3 flagellar joints, 3 club joints), the scape is short, broad, the pedicel narrow and the first flagellar joint long. The abdomen is widened behind, truncate. The legs are black, excepting tips of femora and tips of hind tibiæ and a blotch on anterior and middle tibiæ, rest honey-yellow.

Hab.—Asheville, N. C.

Described from two specimens reared from oak gall *Holcaspis centricola* O. S.

HYPERTELES Forster.

82. **Hyperteles blastophagi** n. sp.—♂ ♀.—Length .03 to .04 inch. Blue-black in males or with greenish reflections in females. The vertex of head is sharp. Antennæ in ♂ brown with long hairs, in ♀ shorter, without hairs and clubbed. The thorax has a faint median groove and the scutellum has the usual two grooves on disk. The legs are pale yellowish, in some specimens almost white, with all the femora, except at both ends, brown or black. Wings hyaline, bordered with very short ciliæ.

Described from eighteen specimens bred from oak gall *Andricus blastophagus* Ashm.

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83. **Hyperteles neuroteri** n. sp.—♂ ♀. Differs from the other species only in being black and in having black femora and a streak on tibiæ. Length .03 inch.

Described from three specimens reared from oak gall *Neuroterus atomus* Ashm. MS.

84. **Hyperteles flocci** n. sp.—♂ ♀. Length .06 to .10 inch. Differs from the other species in its larger, stouter form; in color, varying from a dark greenish-blue to an æneous-green, in having all the femora blue or green, excepting tips, and in having a large blotch in middle of posterior tibiæ and sometimes, not always a blotch on anterior and middle tibiæ.

Described from several specimens reared from oak gall *Andricus flocci* Walsh.

TETRASTICHUS Haliday.

85. **Tetrastichus floridanus** n. sp.—♂ ♀. Length .08 to .10 inch. Differs from *Tetrastichus racemariæ* Ashm., in lacking the middle groove on thorax and in having brown antennæ and pale brown, immaculate legs. The antennal scape is also pale.

Described from numerous specimens taken at large. This species might easily be separated into a distinct genus by the absence of the mesonotal groove under the name *Tetrastichodes*.

86. **Tetrastichus californicus** n. sp.—♀. Length .08 inch. This species is entirely shining black, with metallic lustre, has a distinct median groove on thorax, the usual two grooves on scutellum, black femora, brown blotch on tibiæ and a black flagellum.

Hab.—Los Angeles, California. Described from a specimen reared from oak gall *Andricus pomiformis* Bassett.

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Some corrections in the Family PSELAPHIDÆ.

BY EMIL BRENDEL, M. D.

Since the time the pathfinder in American entomology, John L. LeConte, described his Batrisus, there has been much doubt as what ought to be looked upon as a variety or a true species. We have been under the impression that the described species occupied a territory of considerable extent. *Batrisus nigricans*, owing to a limited amount of material, comprised Northern, Southern, Eastern and Western forms of a similar appearance, though Dr. LeConte expressed in a letter to me his doubts of their identity. After his demise his rather short descriptions were more closely examined, resulting in the conviction that *B. nigricans* was not to be found far to the North and West and our friend Casey described accordingly the differences, which pertain chiefly to the form of the antennæ and the face.

The true *B. nigricans*, collected in Georgia (vertice lævi, leviter oristato frontis apice bidentato retusoque. Antennæ articulo tertio crassiusculo secundo quartoque majore), has a companion in a new form from Long Island, N. Y., but differs in the first antennal joint bearing a sharp thorn perpendicularly, causing the joint to appear triangular (♂), which I have named *B. spinifer*, differing again from *B. denticornis* Casey, by the first joint having the perpendicular tooth blunt and a shielding flat tooth (prolongation) above the insertion of the second joint, which is even longer than the third, and by the form of the clypeus, which is transverse, finely sculptured, while in *B. spinifer* it is long, obtusely conical.

B. cephalotes Casey (occurring from East to West along the lakes and adjoining territory), differs from others in having *no* carina on the occiput near the base. Vertex between the foveæ and near the occiput with a faint transverse impression. The frontal margin faintly erect in the middle, profile of clypeus and vertex nearly rectangular. The declivous portion of the frontal margin emarginate, the lobes on each side of the emargination setiferous, the small teeth emerging from the depth of the emargination (in fresh specimens yellow with black shining tips) appear like the teeth of a saw; the clypeal tuber more prominent than in *spinifer*, is small, rounded,

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bearing on the upper end next to the subfrontal excavation whisker-shaped tufts of hair; each side of the tuber the clypeal margins are reflexed. The frontal margin in ♂ sulcate in the middle; the pendant produced, lobes each side of the emargination are common to all those species belonging to the "nigricantes" beset with convergent hairs. The first joint of the antennæ in this species is convex below, second larger than third, not transverse as in the ♂ of *B. spinifer.*

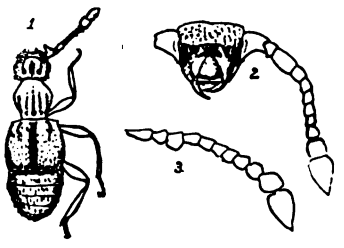
The ♀ ♀ of *B. cephalotes* and *spinifer* differ in the second joint of the antennæ; the carina on vertex.

I may further add that the reflexed portions of the clypeus are sharp angled and appear by superficial examination as horns, so that with the clypeal tuber the clypeus appears 3-horned, like the clypeus of *B. globosus.*

I find that Casey does not mention the impression on the vertex.

The setigerous punctures Casey mentions I was not able to find on those small teeth in the subfrontal excavation.

Batrisus spinifer n. sp.—Shining black, long, densely pubescent. Elytra, marginal rounded angle of the prothorax and supra-antennal tubercle in sunlight blood-red, antennæ, palpi and legs rust-red. Head quadrate, vertex smooth, but little convex, with an entire countersunk fine carina, circumambient sulcus conspicuous, ending posteriorly in round spongious foveæ, twice as distant as either from the eye; lateral margin overhanging the eyes by its sharp carinate edge, punctate, more so the frontal margin, which is in the male narrowly concave in the middle, and divided by a fine impressed line, declivous anteriorly to the inter-antennal line, the lateral part of the declivity beset with long convergent hairs; between these hair pencils emarginate from where two pairs of the small triangular teeth are emerging, the outer ones smaller inconspicuous. Subfrontal excavation deep, from the bottom of which a broad, triangular, horizontal tooth stretches out, resting with the acute point on the tips of the clypeal tuberosity, the base of which rests again on the transverse labrum; the cone is just perceptibly higher than broad at the base, and laterally separated by a groove from the lateral expansion (wing) of the clypeus, which is concave, with a retuse angulated margin. The profile of the face resembles somewhat the form of a



1.—Batrisus spinifer *Br.*
2.—Antennæ of ♂.
3.—Antennæ ♂ B. nigricans *Lec.**

* I have inserted this figure from a sketch made from LeConte's ♂ type (G. H. Horn).

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sheep's face. Antennæ ♂ longer than head and prothorax, joint 1 as long as 3, and more than twice as long as 2, triangular, the face angle thornshaped and pendant; 2, transverse just visibly broader than long; 3, little thicker than 2; 4–8, obconical gradually smaller; 8, quadrate; 9, transverse, truncate at base, obconical; 10, larger globose, as thick as the 11th, which is conical as long as the two preceding together, obliquely pointed. In ♀ the frontal margin is interrupted in the middle continuous with the clypeal surface, which is roundly margined anteriorly and the 1st antennal joint convex below; 3, strongly obconical, longer than wide, longer than the 2d or 4th; 10, not as thick as the last joint, which is two and one-half times longer, rounded at base, jointed at tip.

Prothorax as long as wide, median sulcus deep, ending abruptly one-fourth from the neck, which is carinate. Discal crests sharp, interrupted before the small, sharp-pointed tubercles, which are nearer to the base than usual. Lateral sulcus entire, separating the smooth lateral margin, which is nearly horizontal about the arcuate lateral angle where it is broadest, narrowing and declining backward to the lateral shallow fovea. The discal space between the crests and the lateral sulcus is uneven with shallow longitudinal impressions. Between the median basal fovea, through which the median sulcus is prolonged to the base each side and the tubercles, is another longitudinally compressed tooth, prolonged anteriorly into a very short second crest. Elytra not punctured, shoulders high, with a very small spine, dorsal lines faint, very short, basal punctures indistinct, sutural stria not dilated, the sutural impressed lines parallel. Abdomen very convex, the basal depression between the short and prominent carina narrower than the lateral depressions; last ventral in ♂ impressed at the base and the penultimate impressed transversely at the tip; in ♀ last ventral longitudinally rugose at the sides. Legs moderately long, tibiæ slightly curvate, the posterior one with a thin process. Length 2. mm.

Bryaxis canadensis n. sp.—Piceous-brown or piceous black, pubescence moderately long, recumbent. Elytra sanguineous. Abdomen black. Legs and antennæ ferruginous. Head as long as wide, the eyes excluded, punctured, more strongly at the sides behind the genæ, the latter convergent, little longer than the eyes, feebly arcuate; foveæ large, equal in size, the posterior ones mutually three times as distant as either from the eye; antennal tubercles prominent, with a few coarse punctures; frontal margin convex, the space between the antennal tubercles concave, bearing the frontal fovea, and here more conspicuously pubescent; eyes coarsely facetted, for their own length distant from the frontal margin. Antennæ from the first to the eighth joint subcylindrical, decreasing gradually in length and thickness, except the fifth, which is a little longer than its neighbors; the eighth smallest, quadrate. Prothorax brown, uniformly very conspicuously and deeply punctured, one-third broader than long, widest in the middle, where it is strongly arcuate, from there to the anterior and basal margin straight; anterior margin one-half the length of the base; middle fovea nude, about double as large as the discal punctures; lateral fovea large, fully visible from above and situated with the anterior margin just behind the middle; the base is garnitured with oblong punctures. Elytra across the shoulders as broad as the prothorax, sides arcuate, diverging, suture one and one-half times as long as the prothorax and three-fourths as long as the width across the tip; disk strongly punctured, all the impressed lines entire, the sutural ones arcuate near the tip and finely punctured, the discal lines convergent toward the tip; basal foveæ three, large, the sutural one farther from the base than the middle one.

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Abdomen moderately convex, more feebly punctured, the pubescence as long as on the elytra, first segment as long as one-third its width, the lateral reflexed margin not broader and the lateral basal impression much larger than in *B. rubicunda*, the basal striæ strongly divergent more than half as long as the segment, including at base a space not broader than between the sutural striæ of the elytra; behind the intermediate coxæ on the metasternum is a deep, sharply defined fovea. Legs and antennæ ferruginous, palpi paler. ♂ antennæ longer, elytra less convex, punctuation and pubescence stronger, intermediate tibiæ spurred, first ventral near the posterior margin transversely impressed, last ventral with a somewhat transverse, nearly circular, well defined, but not deep impression. Length 1.5 mm.

From Canada. Differentials are: the strong punctuation, the long, divergent and very appropriate abdominal striæ.

Contrasting the former species, I give here the description of *B. gemmifer* Lec., which was only presented in a synopsis.

B. gemmifer Lec.—Ferruginous to red-brown or darker, pubescence very fine and short. Head from base to frontal margin as long as the width across the genæ, impunctate, except on the antennal tubercles, fovea equal in size, small, mutually twice as distant as either from the eye and in a line with them: frontal margin slightly convex, antennal tubercles small, but well defined, space bearing the frontal fovea slightly concave. Eyes longer than the genæ, gemmate; antennæ half as long as the body, second joint as long as the first, not as thick; 3d longer than the 2d, obconical-cylindrical, thinner; 3d to 7th cylindrical, subequal; 8th as thick as the 7th, of equal dimensions; 9th little longer and thicker, obconical; 10th subglobular, larger; 11th nearly double as thick as the 10th, in length equal to the three preceding conjointly, from the middle strongly conical and somewhat obliquely behind the middle, more convex than in *B. rubicunda;* middle foveæ small, deep, conspicuous, lateral ones not larger than the occipital foveæ not fully in view from above and situated one third from the base; disk conspicuously punctulate (magnified 30 diameters); base double as wide as the anterior margin. Elytra across the shoulders wider than the prothorax, sides arcuate behind the middle, where the disk is one-fourth wider than the length of the suture, convex; tip and sides very declivous, posterior margin laterally slightly sinuate; disk (magnified 60 diameters) scarcely perceptibly punctulate, except on the posterior declivity, where it is distinctly punctured; sutural lines convergent from behind the middle to a spinous sharp point on each elytron; discal lines strictly parallel and but slightly convergent near the tip; basal fovea small and near the base. Abdomen not punctured, first segment not longer than one-fourth its width, striæ very short, one-sixth of the length of the segment, very divergent and not further apart than the elytral sutural lines; last ventral punctured. ♂ last ventral inside of a nearly circular space rather flattened, but not impressed. Length 1.3–1.4 mm.

There are varieties in color and the strength of the punctuation of the prothorax and elytra.

This seems to be the most common species in Iowa. It differs from *congener* and *rubicunda* by the punctuation of the prothorax, the

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two latter species being impunctate, the abdominal striæ, which are further apart in those two species; *congener* is much smaller, evenly leather-colored and does not occur in the West.

The gemmate appearance of the eyes is caused after death by exsiccation.

When I published the description of *Decarthron cornutum* and *Bryaxis inornata*, I was ignorant as to their relations; afterwards I found them in loving unison. They both differ so much from their supposed genera in every respect that I deemed it necessary to separate them, though the antennæ of *D. cornutum*, the male, show a faint divide between the 4th and 5th joints, which are fairly ankylosed.

ANCHYLARTHRON n. g.

Differing from Bryaxis by the elongate form of the body, the sculpture of the head (♀) having small, lateral foveæ faintly connected by an obsolete circumambient sulcus (in some entirely obliterated) similar to some Batrisus, no frontal fovea, globose prothorax without any impression, or but faint indications hardly discernible, the want of discal elytral lines indicated by faint basal impressions, and the ♂ from Decarthron, by the elongate form, the sculpture of the head, want of elytral discal lines and the ♂ and ♀ from both named genera by the joints of the antennæ, the last being fusiform as long as the four preceding.

Respecting the mode of living, they differ from all Bryaxes by a gregarious life with ants like Batrisus, which they resemble in some respects.

A. cornutum (*Decarthron*) ♂ Brendel.
inornata (*Bryaxis*) ♀ Brendel.

My *Bythinus carinatus* has two claws and will be separated from the genus Bythinus with a new name, if an established genus of a foreign country does not apply.

My Fustiger is in every respect an Articerus, and must be satisfied with that name.

Pytna *Casey*, is a true Tyrus, even *in minutiis*.

Atinus is, in my opinion, a Chennium, which has, according to Aubé, four palpal joints, like all the Pselaphidæ, and all are very short and connate. This would perhaps include the new genus Biotus *Casey*.

Batrisus, when living, move their abdominal rings by stretching and retraction not unlike the abdominal movements of the Wasps.

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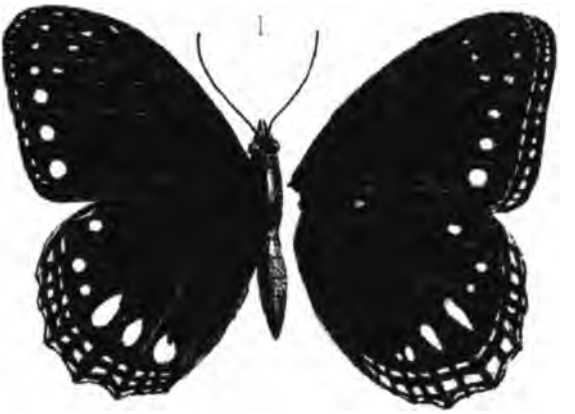

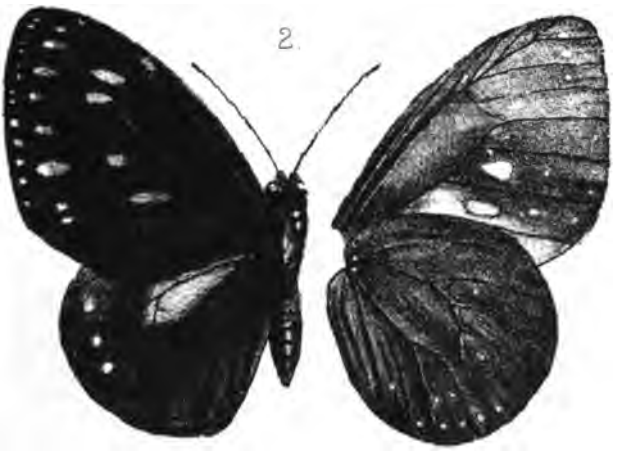

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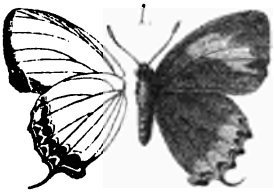

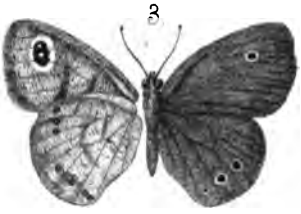

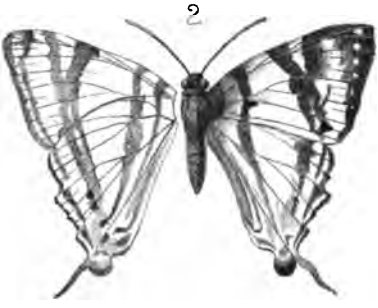

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Revision of the species of LACHNOSTERNA of America North of Mexico.

BY GEORGE H. HORN, M. D.

Since the publication of the "Revision" by Dr. LeConte, in 1856, practically nothing has been done with the numerous species which have accumulated in our cabinets. As it is never profitable to describe isolated species in troublesome genera, it was thought better to accumulate as large series as possible in order to determine the limits of variation, and thereby fix the value of many described from uniques. Unfortunately, many of the uniques were females, and without the opposite sex it was nearly impossible to fix their correct position in the groups in relation to those whose males were known. The process of accumulation produced at last such an overcrowding and confusion as to render the material of no value without arrrangement, and a preliminary study showed that the males were known of all the described species with two exceptions, *æqualis* and *nitida*, while of the vast majority both sexes were present.

Having succeeded thus far with the species, of which the types were accessible to me in the cabinet of Dr. LeConte, there remained the task of correctly identifying those passed over by Dr. LeConte as unknown or unrecognized which had been described by Blanchard, in France, and Burmeister, in Germany. Fortunately the types of the former had been studied by us in the Museum of the Jardin des Plantes with the kind assistance of MM. Blanchard and Lucas. The Burmeister types have not been seen by either of us; however, many if not all the specimens were sent to that author by Dr. Chas. Zimmerman, in whose collection now at Cambridge several species have been found with the number as used by Burmeister. It is inexplicable how three of the species escaped recognition by Dr. LeConte.

In the following pages 81 species are described; of these both sexes are known in 60; 17 have been described from males, and of this number 6 are unique; 4 from females, of which 3 are unique. The material used is as follows:

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The Museum of Comparative Zoology, at Cambridge, containing the LeConte series. I have had occasion many times to express my thanks for the kind attention and assistance received.

The National Museum series, through the kindness of Prof. C. V. Riley.

The cabinet of Henry Ulke, at Washington, which has always been open to me without restriction.

The cabinet of Mr. Samuel Henshaw, of Cambridge, including the material of C. P. Austin.

From Mr. Charles Strumberg, of Galesburg, Ill., an exceptionally fine and large local series from that region.

A series kindly loaned by Aug. Merkel, of New York City.

My own cabinet, containing all the described species excepting *æqualis* and *longicornis*, in which are many specimens kindly given by Messrs. Schwarz, Lugger, Fuller and Snow.

———o———

At this time it seems hardly necessary to dwell on the reasons for the suppression of the genera formed at the expense of Lachnosterna further than to state that the characters are so unimportant that to insist on their strict interpretation would not only divide the genus in a very unnatural manner, but separate very closely allied species. In order to realize this it is simply necessary to refer in the bibliography to the species ranged by Burmeister as Trichestes, and to learn that LeConte has described the same species as a Lachnosterna and an Endrosa. The only possible division of the genus on characters at all constant would be that indicated by the sexual characters of the hind tibial spurs of the male, while a small group might be separated in which the anterior tibiæ have but two teeth. By this means Groups *IV* to *XI*, inclusive, would form Lachnosterna proper. Groups *I* to *III* and *XII* to *XVII*, if taken all together would constitute a rather heterogeneous assemblage, while Group *XVIII* is for the present sufficiently distinct. Until the genera of Rhizotrogini are more carefully studied with the increased material now at hand, it seems useless to divide any of the genera at present existing.

By the methods in vogue the structure of the claws plays an important roll in the definition of genera, but I have elsewhere shown (Trans. Am. Ent. Soc. 1878, p. 138, *et seq.*) that species which must be associated from the fact that they possess a facies and many struc-

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tural characters in common, show such modifications of the claw that some of the species of Listrochelus might in one or even both sexes be called Lachnosterna, while others have absolutely simple claws. The pectinate claw which should be characteristic of the genus is possessed by not more than half the species, and even then by the males alone.

While the claws of Lachnosterna do not vary to the extent shown in Listrochelus, there are important modifications. The usual form is that in which there is a median tooth, and in probably the majority of cases the tooth is longer and stronger in the females. In nearly all the species of the aberrant groups (*I* to *III* and *XII* to *XVIII*) the tooth is intra-median and small, although in many of the females the tooth is median and strong. In one species the tooth is distinctly in front of the middle (*hirtiventris*). There is no special form of claw coincident with the modifications of structure of the hind tibial spurs.

A curious monstrosity (?) is shown by the outer anterior claws of the male of *vehemens* (Pl. iii, fig. 9, a, b, c), in which there is a small additional tooth between the apex and the normal tooth. From what we know of genera at present existing, this structure is probably a remnant of some type now extinct.

We owe to Dr. LeConte the observation that two primary series exist in Lachnosterna: *first*, those in which the posterior tibial spurs of the male are both free and movable; *second*, those in which the inner spur is fixed, while the outer alone is movable.

In the first series the last abdominal segment is short, sometimes almost linear, and the tooth of the claws usually intra-median, at times almost basal.

In the second the last ventral is longer, in fact nearly as long or even longer than the preceding segment, and the tooth of the claw median.

These characters are by no means constant in the two series. The length of the last ventral segment in the first series is subject to such variation that, from the linear form, it approaches very closely to the length observed in many of the species of the second series. Nor is the position of the tooth on the claw constant, as in very many females the tooth may be strong and median, while in the males it is smaller and within the middle.

In the table the structure of the male hind tibial spurs has been taken as a character of first importance, as there is here no variation.

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At this time it is as well to note the fact that the spurs of the female hind tibiæ are always movable, and there are always two spurs, while in some of the males of the second series above indicated the fixed spur may be very short or entirely absent, as in *prununculina*, etc. (fig. 16)

From the fact that the arrangement of the species is based almost entirely on sexual peculiarities of the male, it is proposed to pass in review the various members of the body and give, as briefly as possible, the modifications whether sexual or otherwise.

Body.—The form is usually more robust in the female, more expanded posteriorly and more convex, and when there are differences in color the female is nearly always darker.

Vestiture.—When the surface is hairy the pubescence is denser and coarser in the female, the erect hairs, if any, are longer (see Group *XII*). The metasternum is nearly always hairy, often densely, the hair often long, but in nearly every instance the hair of the female is shorter and less dense.

Head.—In a number of species in various parts of the genus the head is notably broad, with rather large and prominent eyes. In this case the head of the male is perceptibly the larger, while in the female the clypeus is somewhat broader at base, being less crowded between the swollen eyes.

Clypeus.—The clypeus is usually more or less emarginate or subbilobed (fig. 1), although there are many species with entire clypeus (figs. 2 and 3). At base the clypeus is expanded, forming a portion of the canthus which invades the eye, but in the species of the *tristis* group (fig. 2) the clypeus is coarctate at base, not extending over the eye, and consequently not wider than the front. The margin of the clypeus is always reflexed, in some very widely, in others scarcely at all with all manner of intergrades. It has been observed that those species with the narrowly reflexed border have the punctures denser than those with the widely reflexed border in which the punctures are very often sparse. The extent of emargination sometimes varies sexually, being deeper in the female (*lanceolata*). The punctuation of both clypeus and front often varies between the sexes.

Antennæ.—It may be said, as a general rule, that the antennæ are longer in the male than in the female. In the vast majority of species the club is much longer in the male, although in some members of the *crenulata* group the difference is hardly perceptible.

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The most important modification is in the number of joints, the usual number is ten (fig. 4), while sixteen have 9-jointed (fig. 11) antennæ. This character must be used with extreme care, and in no case should a species be said to have 9-jointed antennæ when but one specimen is at hand. Instances are by no means rare of specimens of well known 10-jointed antennæ species with but nine joints and others will have the two antennæ unequal in the number of joints. It must not be forgotten that the tendency is toward a reduction of the number of joints by a coalescence and never to an increase of the number, that is, the 10-jointed species have occasionally individuals with 9-jointed antennæ, but in no 9-jointed species has an individual ever been seen with ten joints. The coalescence may go still further in the 9-jointed species, as specimens are before me in which not more than eight joints can be counted. In one species (*errans*) all the males seen have 10-jointed antennæ, while the four females seen have them 9-jointed.

MAXILLARY PALPI.—The terminal joint varies in length between the species as well as in its form, being either cylindrical and obtuse, fusiform or ovate, often with a flattening or impression on the outer side, but neither peculiarity seems to be confined to, or characteristic of any group.

THORAX.—This member varies in form as will be seen by reference to the descriptions. In every case the form described is that seen when viewed directly from above. Nearly all the species have the lateral margin more or less ciliate, but the hairs are so apt to be lost that no mention is made of them unless conspicuous.

ELYTRA.—There is no great difference in the form or sculpture of the elytra, except in *cribrosa*, in which the surface is subsulcate, the intervals forming nine indistinct costæ on each side. In the other species the costæ hardly deserve that name, except theoretically. The sculpture consists of a well-marked sutural costa limited by a deep stria, although in several species this costa is absent (*ecostata* and *politula*). There are three oblique discal costæ and one submarginal parallel with the outer margin. The first costa, when distinct, is dilated posteriorly, and is there limited internally by the sutural stria. The other costæ are scarcely distinct. The submarginal is not often well defined.

The extreme margin of the elytra is ciliate in very many of the species, but the hairs are often lost by abrasion.

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PYGIDIUM.—While the pygidium does not differ in the sexes very materially in some species, in very many that of the female is much more elongate, often more convex, the punctuation more defined and the surface more shining.

ABDOMEN.—The differences are for the most part of a purely sexual nature, and their description is given with each species.

LEGS.—As a rule the legs of the female are shorter and stouter than in the male (fig. 8). This is especially noticeable in the front tibiæ and hind femora. The tarsi are all shorter in the female, more perceptibly in those of the hind leg. The greatest disparity in length is observed in the species of the first and second groups, elsewhere the difference is not so great, the usual ratio being—the first four joints of the male hind tarsus are equal to the five of the female. The only other tarsal modification is that of *calceata* (fig. 15). The sexual differences in the claws have already been explained.

The posterior tibiæ are either squarely or obliquely truncate at apex, the edge continuous in all the species excepting those of Groups *VI* and *VII*, in which in the males there is a sinuation of variable extent at the base of the fixed spur from which a broad groove extends along the inner edge of the tibia (figs. 13–14).

In the grouping of the species which follows I have adhered to the characters used by Dr. LeConte, but have modified their use to suit the greatly increased material. The subject has been a very difficult one to treat, in the *fusca* group especially, from the tendency to vary in those characters most serviceable in a synoptic table. With a little experience there will be no great difficulty in referring either sex to its appropriate group, but beyond that males alone can be safely used.

The following arrangement seems to give a fairly natural sequence of the species:

Hind tibiæ ♂ with both spurs free.....2.
Hind tibiæ ♂ with one spur fixed.....5.
2.—Species very robust, one or both sexes apterous; hind tarsi ♂ very long, those of ♀ scarcely longer than the tibiæ.....3.
Species of usual oblong form; both sexes winged.....4.
3.—Body clothed with scales; thorax not narrowed behind.
Group I, **lanceolata.**
Body glabrous; thorax widest at middle, narrowed at base as well as apex.
Group II, **farcta.**
4.—Inner spur of hind tibiæ ♂ stout and contorted (fig. 12)..Group III, **torta.**
Spurs of hind tibiæ ♂ both slender.....11.

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5.—Fixed spur of ♂ hind tibia very short or absent (fig. 16).....6.
Fixed spur at least moderately long.....7.
6.—Antennæ 10-jointed.....Group IV, **ephilida.**
Antennæ 9-jointed.....Group V, **longitarsis.**
7.—Hind tibiæ ♂ with a sinuation of the apex at the base of fixed spur (fig. 13–14).....8.
Hind tibiæ ♂ squarely truncate (fig. 9–10).....9.
8.—Clypeus entire, deeply concave, the margin widely reflexed; antennæ 9-jointed.....Group VI, **dispar.**
Clypeus more or less emarginate, feebly concave; antennæ 10-jointed. Group VII, **congrua.**
9.—First joint of hind tarsus in both sexes with an abruptly formed process on the outer side (fig. 15).....Group VIII, **calceata.**
First joint of hind tarsus of normal form.....10.
10.—Antennæ 10-jointed.
Body above glabrous.....Group IX, **fusca.**
Body above pubescent.....Group XI, **ilicis.**
Antennæ 9-jointed; body sometimes hairy.....Group X, **balia.**
11.—Anterior tibiæ normally tridentate.....12.
Anterior tibiæ bidentate, the apical tooth more prolonged (fig. 6). Group XVIII, **maculicollis.**
12.—Antennæ 10-jointed.....13.
Antennæ 9-jointed.....Group XV, **quercus.**
13.—Body more or less hairy.....14.
Body glabrous.....15.
14.—Clypeus more or less emarginate, not coarctate at base. Group XII, **crenulata.**
Clypeus entire, rather deeply concave, the base coarctate (fig. 2). Group XVI, **tristis.**
15.—Form moderately robust, margin of thorax entire..Group XIII, **submucida.**
Form elongate, parallel, margin of thorax rather strongly crenate. Group XIV, **ignava.**
Form ovate, claws of male dissimilar on the different tarsi, the two claws of the middle tarsi very unlike; claws of female normal (figs. 42–45). Group XVII, **heterodoxa.**

Group I, lanceolata.

Body short, robust, parallel ♂ or ovate ♀, clothed with scales partly concealing the surface, the male winged, female apterous. Thorax not narrowed behind, the margin more or less crenate. Legs shorter and stouter in the female, the hind tarsi not longer than the tibiæ. Spurs of hind tibiæ slender and moderately long, free in both sexes. Ventral segments of male carinate along the median line. Antennæ 10-jointed. Tarsal claws toothed near the base.

This group contains but one well-known species originally described as Melolontha by Say, and afterwards made the type of Tostegoptera

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by Blanchard, which was alternately suppressed and revived by LeConte. Finding no reason based on structure, or suggested by convenience, I return it to where LeConte first placed it.

1. **L. lanceolata** Say.—Variable in form in the sexes, brownish to nearly piceous, subopaque; surface alutaceous, sparsely clothed with elongate whitish, or yellowish scales. Clypeus sinuate at middle, more distinctly ♀, margin rather widely reflexed, densely punctured, scales extremely small, front rather more roughly sculptured, the scales more hair-like in the males. Thorax not narrowed at base, arcuately narrowed in front, the margin strongly crenate, with short ciliæ; surface closely not deeply punctate, each puncture with a scale, median line smoother. Elytra not distinctly punctured, but with an imbricate surface, the sutural costa distinct, the discal costæ very feeble. Pygidium opaque, with close, but shallow punctures and few hair-like scales ♂, or more shining, more sparsely punctate, smoother near apex and sparse scales ♀. Metasternum densely finely punctate, the hairs short, but dense. Abdomen moderately closely punctulate, smoother at middle with numerous scales. Tarsal claws curved, toothed near the base, tooth small ♂, larger ♀. Last joint of maxillary palpi cylindrical, not compressed. Length .52—.68 inch; 13—17 mm.

MALE.—Form oblong, nearly parallel, body winged; metasternum of normal length. Antennal club nearly as long as the stem. Second ventral segment obtusely carinate at middle, third and fourth with an elevated crest, higher on the fourth, fifth segment slightly concave, emarginate at middle of posterior border. Pygidium broader than long. Tarsi long and slender, the posterior one and a half times the length of the tibia. Spurs of hind tibiæ very slender. Scutellum oval (fig. 7).

FEMALE.—Ovate, ventricose, apterous; metasternum short. Antennal club much shorter than the funiculus. Abdomen simple. Legs stouter than the male, the tarsi stouter and shorter, the posterior not longer than the tibia. Spurs of hind tibiæ shorter and broader. Scutellum transverse (fig. 8).

VARIATIONS.—When the specimens are perfectly fresh the scales cover the surface very evenly; when they have been transported and subject to slight abrasion the scales are partly removed along the lines of the discal costæ, so that on each side are three abraded vittæ.

This species formed for Blanchard the type of Tostegoptera, was recognized by Burmeister, but rejected by Lacordaire and LeConte as based on insufficient characters.

Occurs from Kansas to Texas.

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Group II, **farcta.**

Form more or less ventricose and convex. Clypeus entire, or faintly sinuate. Antennæ 10-jointed. Last joint of maxillary palpi fusiform or ovate, feebly or not impressed. Thorax broadest at middle, narrowed at apex and base, the margin more or less serrate. Metasternum shorter than normal, very short in the females of all and also the ♂ of *cribrosa.* Legs stouter in the females, the hind tarsi much shorter. Antennæ 10-jointed.

The group has but one peculiar character common to all the species—the form of the thorax. All three are dissimilar in appearance, and with more species might be separated into separate groups.

One species was made the type of Eugastra, for the retention of which no valid reason exists.

The species are as follows:

Elytra subsulcate, both sexes apterous, the metasternum very short. 2. **cribrosa.**

Elytra without grooves, at most with the normal costæ feebly indicated; both sexes very feebly winged.

Piceous black; elytra with scattered white scales.....3. **æqualis.**

Chestnut brown or piceous; elytra without scales or hairs.....4. **farcta.**

These species belong to the Rio Grande Valley and northward.

2. **L. cribrosa** Lec.—Broadly ovate and convex, piceous black, shining. Clypeus feebly sinuate, margin narrowly reflexed, surface densely punctured and opaque, punctures coarser in the female. Thorax obtusely angulate at middle, narrowed at base and apex, margin coarsely serrate and ciliate; surface very coarsely, densely and moderately deeply punctured; a short, smooth, median line. Scutellum in both sexes short and transverse. Elytra with basal margin slightly reflexed, form broadly oval; surface subsulcate, or (if preferable) with eight obtuse discal costæ, the intervals coarsely, confluently punctured. Pygidium with coarse, shallow, sparsely placed punctures. Metasternum very coarsely, not densely punctured, the hairs extremely short. Abdomen sparsely coarsely punctate. Claws arcuate, a moderately long acute tooth near the base in both sexes. Last joint of maxillary palpi ovate, with a feeble impression. Metasternum short, body apterous in both sexes. Length .65—.90 inch; 16.5—23 mm.

MALE.—Antennal club not as long as the funiculus. Abdomen broadly impressed at middle. Hind tibial spurs slender, the tarsi much longer than the tibiæ.

FEMALE.—Antennal club small and lenticular. Posterior legs stouter than in the male, the tarsi not longer than the tibiæ, spurs slender, but broader than in the male.

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VARIATIONS.—As might be expected in a species with such rough sculpture, the distinctness of the costæ may vary and the sculpture between them be less pronounced. The color also varies, but this is a matter of greater or less maturity.

With this species I have united *ventricosa* Lec. The two species were each described from two females, the *cribrosa* types being smaller and less mature. The genus Eugastra was founded to receive these species, but there are no reasons why it should be retained distinct from Lachnosterna.

Occurs in Texas in the Rio Grande Valley.

I have a species from Mexico closely allied to the above, but smaller; the elytra shorter and broader, with but four costæ. As it is represented by a female in not very good state, and as it is not advisable to complicate bibliography I pass it with this mention.

3. **L. æqualis** Lec.—Ovate, convex, piceous-black, shining; surface with sparsely placed, white, scale-like hairs. Body ♀ with rudimentary wings. Clypeus entire concave, margin reflexed; surface coarsely, not densely punctured. Thorax widest at middle, the margin serrate, sides arcuate, disc deeply coarsely punctured. Elytra deeply not closely punctate, the discal costæ entirely obliterated. Pygidium convex, strongly punctured. Metasternum with moderately dense short hair. Length .80 inch; 20 mm.

The above short description is practically a transcript of that of Dr. LeConte. The specimen is not now before me, and as far as I know the unique has never been duplicated. By its facies it recalls *ventricosa* if the latter is deprived of costæ.

Collected at El Paso, Texas.

4. **L. farcta** Lec.—Ovate, convex, facies robust, rufocastaneous, dark brown or piceous, moderately shining. Body feebly winged in both sexes. Clypeus feebly sinuate, border reflexed, more widely in front; surface coarsely and moderately closely punctate, the front more coarsely. Thorax broadest at middle, very little narrowed in front, margin distantly crenate, with short ciliæ, punctures of the disc moderately coarse, regularly placed, not dense, near the lateral margin very sparse. Elytral punctures as coarse as those of the thorax and rather deeper, as closely placed; surface slightly scabrous, sutural costa well marked, the discal costæ scarcely visible. Pygidium convex, gibbous near apex ♀, punctures finer than on the thorax, scarcely visible near the apex. Metasternum sparsely punctate, the hair very short and sparse. Abdomen sparsely punctate, more coarsely in the female. Claws moderately arcuate, the tooth intramedian in both sexes, and acute, longer in the female. Last joint of maxillary palpi fusiform, not impressed. Length .72—.97 inch; 18—24.5 mm.

MALE.—Antennal club as long as the funiculus. Abdomen broadly impressed at middle. Penultimate ventral segment with vague oblique impressions, which meet at the suture in front, behind

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them the surface slightly quadrate. Elytra slightly broader at middle. Hind tarsi much longer than the tibiæ. Outer spur of hind tibia broad, with translucent border, apex obliquely truncate; inner spur shorter, broad, squarely truncate.

FEMALE.—Antennal club small, lenticular. Spurs of hind tibiæ longer and more slender. Elytra broader behind the middle. Posterior tarsi not longer than the tibiæ. Posterior legs much stouter than in the male.

VARIATIONS.—The color varies from rufocastaneous to dark brown, almost piceous. The sculpture varies but little.

The male is very like other robust species as *crassissima* in form, the female is more inflated posteriorly as in the females of the European Geotrogus. The metasternum in both sexes is short, more so in the female.

Occurs in Texas, Waco (Belfrage), New Braunfels (Lindheimer).

Group III, torta.

This group consists of two species, the peculiar character being found in the strongly curved and stout inner spur of the male hind tibia. The clypeus is emarginate, not deeply, the border reflexed; last joint of palpi impressed; the antennæ are 10-jointed; the spurs of the hind tibiæ are free in both sexes; the last ventral segment short; hind tarsi distinctly shorter in the female.

The two species are as follows:

Large, robust, sculpture of surface well marked. Inner spur of male hind tibia inserted nearly at a right angle to the apex.....5. **torta.**

Smaller, not robust; surface comparatively smooth. Inner spur of male hind tibia inserted in the axis of the tibia.....6. **hamata.**

These two species are from Texas.

5. **L. torta** Lec.—Oblong, slightly broader posteriorly, convex, facies rather robust, reddish-brown, moderately shining. Head moderately broad. Clypeus distinctly emarginate, the margin reflexed, densely punctured, more coarsely in the female, front similarly punctured. Thorax with sides arcuate, the margin entire, crenate anteriorly, the disc rather closely and moderately coarsely punctate. Elytral punctures rather coarser than those of the thorax and somewhat more closely placed; the surface somewhat rugulose, the discal costæ often nearly wanting, sometimes feebly indicated. Pygidium closely and coarsely punctate. Metasternum moderately closely punctate, the hair rather long not dense. Abdomen coarsely, but not densely punctured over the entire surface, the punctures less deep at the middle. Last joint of maxillary palpi fusiform, not impressed. Claws strongly arcuate. the tooth smaller and intramedian ♂, larger and median ♀. Length .75—.96 inch; 19—24 mm.

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MALE.—Antennal club a little shorter than the stem. Abdomen broadly flattened, the penultimate segment with a slightly granulate space posteriorly. Inner spur of hind tibia stout, inserted at the side of the end of the tibia, curved in a quadrant inward and downward, outer spur small, triangular (fig. 12).

FEMALE.—Antennal club shorter than the funiculus. Spurs of hind tibiæ normal. Posterior tarsi distinctly shorter than in the male.

VARIATIONS.—Like nearly all the reddish-brown species the color may vary in intensity. The costæ of the elytra are more distinct in some specimens, and in these the surface seems more rugose.

A very distinct and easily determinable species of the male is at hand, fortunately that sex is by far the most abundant.

Occurs in Texas, Waco (Belfrage), San Antonio (Brouse).

6. **L. hamata** n. sp.—Oblong, slightly broader behind, rufotestaceous, thorax darker, head brown; surface shining. Clypeus emarginate, margin narrowly reflexed; surface, with the front, closely punctate. Thorax narrowed in front, sides feebly arcuate, margin distantly interrupted by the insertion of short ciliæ, surface with moderate punctures; regularly, not closely placed. Elytral punctures similar to those of the thorax, but deeper; the discal costæ scarcely visible, the sutural well marked. Pygidium coarsely moderately closely punctate, smoother at the sides and apex. Metasternum finely not densely punctate, the hair moderately long, but not dense. Abdomen sparsely punctate, smooth at middle. Legs more red in color, tibiæ and tarsi brown. Claws feebly arcaute, the tooth moderate in size and intramedian. Last joint of maxillary palpi cylindrical, not impressed. Length .66 inch; 17 mm.

MALE.—Antennal club a little shorter than the stem. Abdomen flattened at middle, the penultimate segment declivous at middle of posterior half and slightly granulate. Inner spur of posterior tibiæ stout, strongly arcuate, arising at the end of the tibia, the outer spur short and triangular (fig. 11).

The unique before me superficially resembles *ephilida*, although somewhat dilated behind, so that while related to *torta*, structurally, it is quite unlike it in facies. The curved spur of the male hind tibia arises in a nearly direct line from the end and projects less inwardly than in *torta*.

One specimen, Texas.

Group IV, ephilida.

This group contains species of cylindrical form and compact build. The head is rather broad. The clypeus is entire in one species, feebly emarginate in the others. Antennæ 10-jointed, club elongate in the

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male. The last joint of the maxillary palpi is fusiform, more or less impressed. Thoracic margin entire, except in *generosa*. Metasternum very feebly hairy, or almost naked, except in *generosa*. Posterior tibiæ of male with the inner spur fixed, although short, and in two species entirely absent. The posterior tarsi do not notably differ in length in the sexes. The claws are feebly curved, although rather stout, the tooth not large, always intramedian or even basal, in the females of one species median. The last segment of the abdomen is rather shorter than usual in the species with one of the hinder spurs of the male fixed.

The following table will assist in the identification of the species:

Clypeus entire, slightly more prominent at middle; abdomen ♂ deeply impressed, the last segment nearly vertical.....7. **latifrons.**
Clypeus emarginate, although feebly at times.
  Metasternum hairy; margin of thorax serrate.....8. **generosa.**
  Metasternum hairy; margin of thorax entire.....9. **prætermissa.**
  Metasternum nearly naked; margin of thorax entire.
    Inner spur of hind tibia ♂ entirely wanting.
      Form robust, surface usually more or less iridescent.
      10. **prunnneulina.**
      Form slender, surface always shining.....11. **glaberrima.**
    Inner spur of hind tibia ♂ distinct.
      Form less slender, surface shining.....12. **ephilida.**

These species are all from the Southeastern Atlantic or Gulf regions.

7. **L. latifrons** Lec.—Oblong, cylindrical, variable in color from purplish-brown to rufotestaceous; surface in the darker specimens decidedly pruinose. Abdomen always pale. Head moderately broad. Clypeus entire (fig. 3), concave, the margin rather widely reflexed; surface sparsely punctate. Thorax arcuately narrowed from the base, margin entire, punctures regularly placed, not coarse nor close, a vague impression of the base each side. Elytral punctures a little coarser and deeper than on the thorax, not densely placed, the discal costæ very faint. Pygidium sparsely punctate. Metasternum rather coarsely and closely punctate, the hairs short and conspicuous. Abdomen sparsely punctate at the sides. Claws feebly arcuate, the tooth median, very small in the male, larger in the female. Last joint of maxillary palpi fusiform, slightly flattened externally. Length .60—.72 inch; 15—18 mm.

Male.—Club of antennæ pale, longer than the stem. Abdomen deeply longitudinally impressed, the impression deeper and broader posteriorly, forming a rather deep triangular concavity in the penultimate segment. Terminal segment placed vertically to the other segments deeply concave at its middle, its apex acute, terminated by two small dentiform processes. Pygidium transverse, convex.

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FEMALE—Antennal club shorter than the funiculus. Pygidium nearly as long as wide, less convex than in the male and more nearly oval.

VARIATIONS.—As stated the color varies from dark purplish-brown to rufotestaceous. As far as I have seen the very dark specimens are always females. The pale males resemble *ephilida* in color, are rufotestaceous, the head and thorax somewhat darker. The pruinosity of the surface is very feeble, easily removed and not visible in the pale specimens.

While this species belongs very evidently in this group, the fixed spur of the male hind tibia is moderately long, the free spur is long and slender. In the female both spurs are long and slender. This species affords an instance of the necessity which often occurs in systematic work, where one character must be rejected which points in a direction opposite to the indication of all other characters.

Occurs in Florida. Dr. LeConte gives New York as the habitat of his types, but this is undoubtedly an error.

8. **L. generosa** n. sp.—Oblong, parallel, moderately robust, chestnut-brown moderately shining; surface slightly pruinose. Clypeus feebly emarginate, margin reflexed, very narrowly at the sides, punctuation coarse and close, quite dense at the middle of the front. Thorax narrowed in front, sides parallel behind, margin coarsely serrate; surface coarsely and rather closely punctate, median line smooth, a distinct depression in the front angles. Elytra with punctures coarser than the thorax and rather more closely placed, except on the declivity; surface slightly rugose, the discal costæ very feeble. Pygidium sparsely punctate, a median smooth space which becomes broader to the apex. Metasternum densely punctate, the hair long and dense. Abdomen very sparsely punctate. Claws feebly curved, the tooth rather long and slightly intramedian. Last joint of maxillary palpi fusiform, slightly flattened externally. Length .75 inch; 19 mm.

MALE.—Antennal club as long as the stem. Abdomen flattened at middle, penultimate ventral with a short arcuate elevation near the posterior border (fig. 36). Last ventral with a moderately deep, distinctly circumscribed concavity, smooth at bottom. Inner spur of hind tibia short.

Of this species but one specimen is now before me. It resembles *latifrons* in form, and has a color similar to that species. It seems to have been sent to Dr. LeConte as *uniformis* Bl., at least specimens so labelled are in his cabinet, but the description as well as notes made by Dr. LeConte show that *uniformis* is synonymous with *ephilida*.

One specimen, Texas.

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9. **L. praetermissa** n. sp.—Oblong, slightly broader behind dark rufotestaceous to piceous brown, usually paler beneath, moderately shining. Clypeus feebly emarginate, the border narrowly reflexed; surface moderately, coarsely, sparsely punctate, front similar. Thorax obliquely narrowed in front, the sides posteriorly either parallel or slightly sinuate, the margin sparsely ciliate, not crenate, punctures moderately coarse, irregularly placed, with a tendency to form groups, median region somewhat smoother. Elytral punctures larger and closer than those of the thorax, somewhat stellate, the surface slightly wrinkled, the discal costæ very indistinct, the submarginal feeble posteriorly. Pygidium convex, the punctures finer and sparser than on the thorax. Metasternum densely punctulate, the hair rather long and dense. Abdomen at sides finely sparsely punctate, the last two segments more coarsely punctate. Last joint of maxillary palpi shortly fusiform, not impressed. Claws arcuate, a strong acute tooth at middle. Length .58—.64 inch; 15—16 mm.

MALE.—Antennal club as long as the stem. Abdomen slightly flattened at middle, the penultimate segment with a slight roughened ridge close to the posterior border; last ventral concave, broadly emarginate at apex. Inner spur of hind tibiæ very short, the outer long and slender.

VARIATIONS.—The specimens before me show no variation, except in size and color.

By its slightly broader form this species resembles the *congrua* group, but the very short fixed spur shows its relationship with the present group.

Only males have been seen. Collected in Louisiana by Morrison.

10. **L. prununculina** Burm.—Robust cylindrical, variable in color from reddish-brown to black; surface sometimes shining, often slightly pruinose, rarely with a dull smoky surface. Clypeus feebly broadly emarginate, the margin moderately reflexed, punctures moderate in size, close but not dense ♂, sparser ♀. Thorax arcuately narrowed in front, nearly parallel behind, the margin entire ♂, or very slightly irregular ♀, punctures coarse, regularly disposed, closely placed, but not dense, the basal margin slightly impressed each side. Elytra punctured similarly to the thorax, the costæ very feeble. Pygidium more finely and closely punctured than the thorax. Metasternum closely and moderately coarsely punctate, the pubescence very sparse and short. Abdomen more finely and sparsely punctate. Claws with a moderate tooth near the base in both sexes. Last joint of maxillary palpi fusiform and impressed. Length .56—.70 inch; 14—18 mm.

MALE.—Antennæ rufotestaceous, club paler and a little longer than the stem. Penultimate segment flattened at middle, an oblique obtuse elevation each side, last ventral moderately deeply concave, the border of the concavity limited posteriorly by a slight ridge which, near the apex, forms a slight cusp each side. Inner spur of hind tibia wanting, the outer long and slender (fig. 16).

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FEMALE.—Club lenticular, shorter than the funiculus. Tarsi somewhat stouter than in the male, but scarcely shorter, the spurs of hind tibiæ long and slender.

VARIATIONS.—There is scarcely any variation in sculpture and very little in form, although the males are a little more slender. The color shows very striking variations which can be best explained by a list of the specimens before me.

Reddish-brown, surface shining—two males.
Reddish-brown, darker than the preceding forms, the surface subopaque, distinctly iridescent—six males, three females.
Brown-black, surface opaque, with slight iridescence—five females.
Piceous black, surface shining, without iridescence—two females.

From the above table it will be seen that the males, as a rule, are paler than the females.

In very well preserved specimens the elytral punctures have a very short hair.

This species is one of those placed by Burmeister in Trichestes, and while he ranges it among those with 9-jointed antennæ he remarks that "third joint before the club has such a distinct stricture that the antennæ may be counted 10-jointed. The specimen described by Burmeister belongs to the second series above described.

This species has, until now, borne the name *cerasina* in our cabinets, and it seems incomprehensible that Burmeister's good description should have escaped recognition.

Occurs in Georgia and Florida.

11. **L. glaberrima** Blanch.—Oblong, cylindrical, rufotestaceous, shining. Head usually a little darker. Clypeus moderately deeply, but broadly emarginate, margins moderately reflexed; surface coarsely and closely punctate, front similarly punctured in the male, more sparsely in the female. Thorax arcuately narrowed to the front, margin entire; surface moderately coarsely, not closely punctate, the punctures evenly disposed. Elytral punctures coarser and closer, the costæ barely visible. Pygidium moderately coarsely punctate, less closely in the female and more shining. Metasternum moderately coarsely and closely punctate, nearly naked, the hairs very inconspicuous. Abdomen sparsely punctate, the last two segments more closely, the punctures also coarser. Claws moderately curved, the tooth intramedian in the male, longer and median in the female. Last joint of maxillary palpi fusiform, distinctly impressed. Length ·50—.60 inch; 13—15 mm.

MALE.—Antennal club as long as the stem. Abdomen slightly flattened at middle, the penultimate segment slightly rugulose, last

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segment concave with two feebly elevated cusps within the concavity. The inner spur of hind tibia entirely absent, the outer long and slender.

FEMALE.—Antennal club shorter than the funiculus. Spurs of hind tibiæ slender and acute, hind tarsi distinctly shorter than the male. Pygidium less transverse.

VARIATIONS.—Except in size this species is very little variable, the color is very uniform.

This species resembles *ephilida* very closely, and differs in having the clypeus more distinctly emarginate. The male sexual characters afford the most certain method of separating the two.

Occurs from Pennsylvania to Florida.

12. **L. ephilida** Say.—Moderately elongate, cylindrical, rufotestaceous, the head and thorax usually darker; surface moderately shining. Clypeus broadly emarginate, the border reflexed; surface moderately closely punctate, the front more densely, the ♀ more coarsely punctured than the ♂. Thorax rather short, sides arcuate, narrowed in front, margin entire, the punctuation moderately coarse, not dense, an indistinct foveæ each side nearer the base than the side. Elytral punctures coarser and deeper than those of the thorax, apparently closer, the discal costæ usually feeble. Pygidium ♂ broader than long; surface irregularly wrinkled, the punctures large and vague, of ♀ smoother, punctured like the thorax, nearly as long as wide. Metasternum closely punctate, the hair moderately long, not dense. Abdomen coarsely, not closely, punctate at the sides, smooth at middle. Claws with moderate size tooth, intramedian ♂, longer and more nearly median ♀. Last joint of maxillary palpi fusiform, almost ovate, distinctly impressed. Hind tarsi similar in the two sexes. Length .55—.75 inch; 14—19 mm.

MALE.—Antennal club not quite as long as the stem, the funicular joints nearest the club transverse. Abdomen broadly channeled, penultimate segment (fig. 21) feebly emarginate at middle, a roughened space in front of the emargination; last segment emarginate, an obtuse cusp each side of the emargination, the middle of the segment abruptly depressed and roughened. Inner tibial spur short, outer long and slender.

FEMALE.—Club of antennæ much shorter than the funiculus. Spurs of hind tibiæ slender.

VARIATIONS.—In the well developed specimens the form is nearly as cylindrical as in *quercus*, but three specimens of smaller size from Texas and Florida are more decidedly ovate and resemble the females of *gibbosa*. In sculpture there is the usual variation in the distinctness of the costæ, and some specimens are slightly more rugose. Among the numerous specimens examined several have been ob-

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served with 9-jointed antennæ. The peculiar abdominal characters of the male leave no doubt that this is merely an accident.

With this species I have united *Burmeisteri* Lec., founded on smaller specimens. The name was given under the supposition that Burmeister had incorrectly identified *longitarsis* Say, but I think that any one who will read his description will be fully satisfied that Burmeister had a genuine *longitarsis* before him.

Occurs from Canada to Florida and Texas.

Group V, longitarsis.

This group contains two species which agree in having the antennæ 9-jointed, the palpi fusiform, distinctly impressed. The spurs of the male hind tibiæ are—the inner very short and fixed, the outer long and slender. The claws have a small intramedian tooth.

The following table will assist in the separation of the species:

Clypeus deeply emarginate; form elongate cylindrical, pale yellowish testaceous, head fuscous or piceous.....13. **longitarsis.**

Clypeus entire; form oblong, slightly broader behind, rufotestaceous, head darker .....14. **clemens.**

Were it necessary, by the presence of other species, these two might form the types of distinct groups.

The first species occurs in the Mississippi Valley, the second in Florida and Texas, and has been erroneously determined by Dr. LeConte as *dispar* Burm.

13. **L. longitarsis** Say.—Slender, elongate, cylindrical, pale yellowish testaceous, front fuscous or piceous; surface moderately shining. Clypeus concave, deeply emarginate, surface shining, coarsely very sparsely punctured, front coarsely densely punctured. Thorax short, transverse, strongly arcuate in front, slightly sinuate, margin entire, fimbriate in front, surface somewhat irregular, the punctures coarse not deep, rather closely placed. Elytra coarsely punctured, the punctures rather shallow, sparser near the apex, the discal costæ very feeble, the submarginal moderately well defined. Pygidium ♂ with coarse shallow punctures, those of the ♀ finer and more sparse near the apex. Metasternum closely, but indistinctly punctate, the hairs moderate in length but sparse. Abdomen sparsely indistinctly punctate at the sides, the last two segments more coarsely punctured, Last joint of maxillary palpi short, fusiform, very distinctly impressed. Claws feebly curved ♂ and with a small acute tooth near the base, the ♀ claw more arcuate, the tooth stronger and median. Length .41 —.52 inch; 10.5 — 13 mm.

Male.—Antennal club a little longer than the stem. Abdomen slightly flattened at middle, the last segment irregularly concave. Inner spur of hind tibia male short, the outer long and slender.

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FEMALE.—Antennal club shorter than the funiculus. Posterior tarsi shorter than in the male.

VARIATIONS.—The costæ vary slightly in their distinctness and the head may be pale brown or nearly black.

The species described by Dr. LeConte as *frontalis* seems hardly entitled to be considered a variety.

Burmeister has very correctly described Say's species, excepting that he has placed it among those with 10-jointed antennæ. The synonomy given is, however, erroneous, *glaberrima* Bl. being an altogether different species.

Occurs from Illinois to Kansas and Montana, southward to New Mexico. A specimen in my cabinet is labelled Louisiana, possibly erroneously.

14. **L. clemens** n. sp.—Oblong, slightly broader behind, rufotestaceous, shining, head piceous. Clypeus concave, entire, margin rather widely reflexed, shining with sparse coarse punctures, front more closely and finely punctate. Thorax short, sides arcuate in front, nearly parallel behind, margin entire, punctures of disc moderate, regularly and rather closely placed, sparse near the sides. Elytra rather more coarsely but less closely punctured than the thorax, the discal costæ scarcely evident. Pygidium moderately punctate, smoother at middle and near the apex. Metasternum sparsely punctate, the hairs short and sparse. Abdomen more finely punctate, smooth at middle. Last joint of maxillary palpi fusiform, slightly impressed. Claws feebly arcuate, the tooth very small and intramedian ♂, or stronger ♀. Length .40—.46 inch; 10—11.5 mm.

MALE.—Antennal club as long as the stem. Abdomen longitudinally impressed, the last segment with a slight concavity. Inner spur of posterior tibia very small, the outer long and slender.

This if one of our smallest species, resembling a diminutive *ephilida*, although less cylindrical. It resembles also *dispar*, but this has a more cylindrical form and differs also in the group characters.

This species is the one determined by Dr. LeConte as *dispar* Burm., and so described in the "Review," but I am convinced that Burmeister's name belongs to another species as will be explained further on.

Occurs in Florida and Texas.

Group VI, dispar.

Clypeus deeply concave, the margin widely reflexed, entire. Last joint of maxillary palpi fusiform, slightly impressed. Antennæ 9-jointed, club moderately long. Metasternum almost naked. Inner spur of posterior tibiæ of male moderately long, prolonged in the

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axis of the tibia, a distinct, but feeble sinuation of the apical margin anterior to the insertion of the tarsus, adjacent to the fixed spur. Claws rather slender, tooth small and slightly intramedian.

One species enters this group. The sinuation of the apex of the ♂ hind tibia allies it with the *congrua* group between which and the *longitarsis* group it naturally takes its place.

The species was made the type of a distinct genus (Gynnis) by Dr. LeConte, but the characters are too feeble to admit of its retention.

15. **L. dispar** Burm.—Elongate, cylindrical, pale rufotestaceous, thorax somewhat darker, head fuscous or piceous; surface moderately shining. Clypeus testaceous, semicircular, concave, margins rather widely reflexed, punctures rather coarse, not closely placed, front more closely punctate, the punctures coarser in the female. Thorax short, scarcely narrower at apex than base, sides regularly arcuate, margin obsoletely crenate, disc with moderately coarse punctures rather closely placed, coarser and deeper in the female. Elytra very coarsely and closely punctate, the discal costæ fine and indistinct, the submarginal slightly distinct posteriorly. Pygidium coarsely sparsely punctate, shining, punctures closer in the female. Metasternum sparsely, coarsely punctate, without hairs. Abdomen more sparsely and finely punctate. Claws feebly arcuate, the tooth small and slightly intramedian, slightly longer in the female. Last joint of maxillary palpi short fusiform, slightly impressed. Length .37—.48 inch; 9.5—12 mm.

MALE.—Antennal club as long as the stem. Abdomen vaguely impressed at middle, last segment slightly concave, a small dentiform process projecting backward from the anterior margin. Inner spur of hind tibia fixed and moderately long.

FEMALE.—Antennal club shorter than the funiculus. Spurs of posterior tibiæ long and slender, the tarsi distinctly shorter than in the male.

VARIATIONS.—Burmeister describes a specimen as fuscous, this is due more to a bad state of preservation than an actual difference of color.

In adopting the Burmeister name for this species (formerly *Gynnis debilis* Lec.) in place of that determined by Dr. LeConte as *dispar*, it is proper that the reasons should be given.

Burmeister indirectly compares the present species with *gracilis* (volvula *Lec.*), a comparison not at all applicable to *clemens* (dispar ‡ *Lec.*); the thorax is in the female more coarsely and deeply punctured than the male, a character very evident in the species under consideration; the shorter clypeus of the female is also noted by Burmeister.

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Occurs in Florida. The specimen described by Dr. LeConte is said to be from near Philadelphia, but the source from which the specimen was obtained causes me to seriously doubt the accuracy of the locality.

Group VII, congrua.

Clypeus feebly emarginate, the border not widely reflexed. Antennæ 10-jointed, although inclined to vary in *gracilis*, the club rather long. Last joint of maxillary palpi fusiform, not impressed. Metasternum conspicuously hairy, except in *gracilis*. Inner spur of hind tibiæ ♂ fixed, long, more or less curved or contorted, a distinct sinuation of the inner edge of the tibia immediately in front of the tarsal articulation and adjacent to the base of the inner spur. Claws strongly toothed, except in *gracilis*. Tarsi shorter in the female than in the male in the species in which the former sex has been examined.

The essential characters are—the sinuation of the apex of the hind tibiæ together with the more or less emarginate clypeus and the 10-jointed antennæ. *L. gracilis*, by its slender form and the small tooth of its claws is rather aberrant as a member of the group, but it is retained here to avoid what might be considered an unnecessary multiplication of groups. The species are distinguished as follows:

Form slender, subcylindrical, yellowish testaceous; tooth of claws small and slightly intramedian.....16. **gracilis.**

Form oblong oval, more or less robust, color rufotestaceous to brown; tooth of claws strong.

Inner spur of hind tibiæ ♂ arcuate, angularly bent at tip (fig. 14). 17. **gibbosa.**

Inner spur not angularly bent, usually nearly as long as the outer spur.

Abdomen ♂ moderately densely hairy at middle and longitudinally impressed; penultimate ventral without transverse ridge; tooth of claws strong and slightly in front of middle (fig. 13a). 18. **hirtiventris.**

Abdomen ♂ glabrous; tooth of claws strong and median.

Abdomen ♂ deeply longitudinally impressed; penultimate segment without transverse elevation.....19. **congrua.**

Abdomen ♂ at most slightly flattened; penultimate segment with a transverse ridge which is excavated posteriorly, parallel with the margin.

Punctures of thorax not coarser than those of the elytra, not close; thoracic margin entire.....20. **postrema.**

Punctures of thorax very coarse and often umbilicate.

Surface shining; form oblong; punctures of elytra distinct and close, the costæ feeble or absent.....21. **affinis.**

Surface pruinose or iridescent; form short and more robust; punctures of elytra feeble and sparse, the costæ nearly always well marked.....22. **prunina.**

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16. **L. gracilis** Burm.—Elongate, cylindrical, pale rufotestaceous, thorax somewhat darker, head fuscous or piceous. Head broad, eyes large, especially in the male. Clypeus short, deeply emarginate, margin not widely reflexed, moderately coarsely not closely punctate, front similarly punctured. Thorax short, not much narrowed at apex, sides strongly arcuate in front, nearly parallel or slightly convergent posteriorly, the margin subcrenate, surface moderately coarsely not closely punctate. Elytra more coarsely and closely punctate, the discal costæ almost entirely obliterated, the submarginal not at all visible. Pygidium shining, very sparsely punctate. Metasternum sparsely punctate, the hairs short and sparse. Abdomen shining, sparsely, vaguely punctate. Claws feebly curved, the tooth small and nearly median. Last joint of maxillary palpi fusiform, elongate, not impressed. Length .41—.52 inch; 10.5—13 mm.

MALE.—Antennal club as long as the stem. Abdomen slightly flattened at middle, penultimate segment at middle abruptly declivous, last segment feebly concave. Inner spur of hind tibia long, obtuse at apex, distinctly curved and slightly twisted on its own axis, outer spur very slender and long.

FEMALE.—Club of antennæ small and lenticular. Spurs of hind tibiæ slender and acute. Hind tarsi scarcely longer than the tibiæ, much shorter than in the male.

VARIATIONS.—This species is very constant in its color, except as to the head, which at times is not darker than the thorax or again piceous. The head of the male is broader (from the larger eyes) than the female, the thorax is consequently broader in front in the male. The antennæ vary in the number of joints being sometimes 9- at others 10-jointed, and specimens rarely occur with the number unlike on each side.

With this species I have united *volvula* Lec. (Endrosa) and *inana* Lec., both founded on unique females, the one with 9-jointed the other 10-jointed antennæ. Among the pale species of Lachnosterna there seems to be a tendency to variation of this sort, while among the darker species it is very rarely seen.

Occurs from Canada to North Carolina and Texas.

17. **L. gibbosa** Burm.—Oblong, convex, slightly broader behind, color variable from reddish-brown to rufotestaceous, moderately shining. Clypeus very feebly emarginate, front more coarsely punctured, convex, with erect hairs. Thorax rather short and convex, the sides arcuate, narrowing in front, the margin somewhat irregular, but hardly crenate, with long ciliæ, disc coarsely rather sparsely punctate, usually with a distinct smooth median space. Elytral punctures as coarse as those of the thorax, but more closely placed; the costæ variable, the submarginal faintly distinct in its apical half. Pygidium convex, subopaque with coarse, but feebly impressed punctures ♂, shining with distinct punctures ♀. Metasternum densely punctured, the hair long and close. Abdomen sparsely

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punctate, very much more coarsely on the last two segments. Last joint of maxillary palpi slender fusiform, not impressed. Claws arcuate, a strong, acute, median tooth in both sexes. Length .48—.64 inch; 12—17 mm.

MALE.—Antennal club a little shorter than the stem. Abdomen broadly longitudinally impressed, penultimate segment slightly convex and regular at middle, on each side obliquely plicate, the last ventral deeply concave, the concavity united in its posterior half by an elevated border slightly united. Inner spur of posterior tibia (fig. 14) somewhat sigmoid in form, the proximal portion arcuate with the concavity toward the tarsus, the apical portion suddenly, obliquely bent.

FEMALE.—Antennæ short, the club small, lenticular, shorter than the funiculus, outer funicular joints more or less transverse. Last ventral segment with posterior border vaguely bisinuate. Spurs of hind tibiæ slender and moderate in length. Posterior tarsi one-third shorter than the male.

VARIATIONS.—The color variation has already been indicated. In the fully developed specimens the elytral costæ are but faintly indicated or even entirely wanting, while in the smaller specimens (which have at the same time a more robust facies) the costæ are well developed and the surface of the elytra more coarsely punctured and rugulose.

In his description of this species Burmeister adds a foot note, which I here translate: "One of the two specimens before me shows a remarkably anomaly; the ventral segments, usually completely united, are distinct, convex in their middle and resemble barrel-hoops in appearance." A similar specimen is now before me, and this discovery caused me to compare the species with Burmeister's description.

This species has long been known in our collections as *futilis* Lec., to which must be added *serricornis* Lec., described from a female.

Occurs from Canada southward to Virginia and from the New England States to Kansas.

18. **L. hirtiventris** n. sp.—Oblong, slightly oval, pale castaneous, moderately shining. Clypeus feebly emarginate, margin narrowly reflexed, surface moderately closely punctate, front more densely and rugosely punctate. Thorax arcuately narrowed from base to apex, the margin somewhat irregular, but not distinctly crenate, the fimbriæ short, the punctures coarse and close, rather dense near the apical margin, an indistinct smooth median space, a distinct channel along the basal margin from the angles nearly to the middle. Elytral punctures coarser and closer than on the thorax, but less deep, the surface slightly wrin-

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kled, the discal costæ scarcely visible, the submarginal distinct. Pygidium coarsely and sparsely, somewhat irregularly punctured. Metasternum densely punctured, the hair moderately long and dense. Abdomen rather closely punctured at the sides, the last two segments more coarsely punctured. Last joint of maxillary palpi fusiform, not impressed. Claws arcuate, the tooth strong, distinctly in front of middle. Length .65 inch; 17 mm.

MALE.—Antennal club as long as the stem. Abdomen rather deeply channeled at middle and with moderately long hair arising from distinct punctures, penultimate segment acutely notched at middle (fig. 17) the last segment abruptly triangularly depressed, the floor of the impression terminating in two rounded lobes between which is a moderately deep acute notch. Inner spur of hind tibiæ moderate in length, projecting slightly obliquely from the tibia, the outer spur longer.

Of this species I have but one male before me, but several others in the cabinet of Dr. LeConte have been examined. It resembles *congrua* superficially so closely that they can hardly be distinguished except by the sexual characters.

The claws are remarkable in having the tooth slightly in front of the middle, the posterior portion of the claw broader than usual. The hairy abdomen is unique.

Occurs in Texas.

19. **L. congrua** Lec.—Oblong, moderately robust, rufocastaneous to piceous, shining. Clypeus feebly emarginate, the border moderately reflexed, surface moderately coarsely and densely punctured, front roughly punctured. Thorax narrowed from base to apex, more obliquely in front, the margin entire, sparsely ciliate, disc moderately coarsely, evenly not closely punctate, a distinct channel along the basal margin from the hind angles nearly to middle. Elytral punctures coarser and closer than those of the thorax, less deeply impressed, the surface slightly wrinkled, the costæ very indistinct, the first discal usually the only one visible beside the sutural. Pygidium coarsely sparsely and indistinctly punctate, the apex truncate. Metasternum densely rather finely punctate, the hair long, dense and silken. Abdomen sparsely finely punctured at the sides, the last two segments much more coarsely punctate. Last joint of maxillary palpi fusiform, not impressed. Tarsal claws arcuate, the tooth moderately large, median and acute. Length .58—.75 inch; 15—19 mm.

MALE.—Antennal club very nearly as long as the stem. Abdomen rather deeply impressed at middle, not hairy, penultimate segment acutely notched at middle, the last segment with a deep triangular impression, with rather abrupt sides, the apical margin sinuous with two small lobes at middle.

VARIATIONS.—There is such a marked difference in color between two large Texas specimens and some smaller ones from Kansas and

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Louisiana that they would hardly be supposed to be the same species, but the male sexual characters are absolutely identical. A similar variation in color is seen in *latifrons*.

Only males have been observed.

Occurs in Missouri, Kansas, Texas and Louisiana.

20. **L. postrema** n. sp.—Oblong, moderately robust, castaneous, shining. Clypeus distinctly emarginate, the margin moderately reflexed, coarsely punctate, closely at middle, more sparsely at the sides, front more coarsely punctate, nearly smooth along the suture. Eyes moderately large. Thorax narrower in front, the sides parallel behind the middle, hardly arcuate in front, the margin entire with very short ciliæ, punctuation moderate, not closely, but quite regularly placed. Elytral punctures coarser and closer than those of the thorax, the postscutellar punctures slightly stellate; sutural costæ distinct, discal costæ entirely obliterated, the submarginal faintly indicated near the apex. Pygidium broader than long, convex, the punctures coarse, but feebly impressed, placed along the base and sides. Metasternum moderately densely punctured, the hair not long nor dense. Abdomen very indistinctly, sparsely punctate at the sides, the last two segments with a few coarse punctures near the sides. Last joint of maxillary palpi fusiform, depressed, without impression. Claws feebly curved, the tooth strong and median. Length .76 inch; 19 mm.

MALE.—Antennal club a little longer than the funiculus. Abdomen slightly flattened at middle, penultimate segment with a transverse ridge close to the posterior suture, beneath which the segment is channeled; last ventral flattened with a few granules. Inner spur of hind tibiæ long and slender.

In this species the emargination of the apex of the hind tibia at the base of the inner spur is less marked than in the other species of the group, although quite evident. Its facies is that of *generosa* or some of the more strongly distinctly punctured forms of *fusca*.

One male, Florida.

21. **L. affinis** Lec.—Oblong, distinctly broader behind, brownish or castaneous, shining. Clypeus acutely not deeply emarginate, border narrowly reflexed, surface coarsely and densely punctate, front more coarsely punctate or even cribrate at middle. Thorax narrowed in front, the sides behind nearly parallel, in front oblique, the margin serrate, sparsely ciliate, surface with coarse and deep punctures moderately closely, but somewhat irregularly placed, the median line usually smoother, the basal marginal channel not distinct. Elytral punctures very much finer than those of the thorax, moderately closely placed, distinctly impressed, the sutural costa distinct, the discal costæ very faint or entirely obliterated, the submarginal extremely indistinct or absent. Pygidium sparsely punctate, smoother near the apex. Metasternum closely, but indistinctly punctate, the hair rather short and sparse ♂, very short ♀. Abdomen sparsely finely punctate, each puncture with a short hair, the last two segments more coarsely punctured. Claws curved, the tooth strong and median. Last joint of maxillary palpus fusiform not impressed. Length .65—.78 inch; 16.5—20 mm.

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MALE.—Antennal club shorter than the stem. Abdomen flattened at middle, penultimate segment with a straight, transverse, rugulose carina, behind which the segment is impressed, so that the carina seems to overhang. Last segment irregularly concave and sparsely granulate, the anterior margin elevated and often extended, forming an oblique carina each side of the median depression. Inner spur of hind tibia long, slender and acute, extending in the axis of the tibia; outer spur slender and slightly longer.

FEMALE.—Antennal club shorter than the funiculus. Last ventral segment moderately deeply and broadly emarginate, the face of the segment either deeply impressed or irregularly eroded. Hind tarsi distinctly shorter than in the male.

VARIATIONS.—In the typical form the elytral costæ are entirely obliterated, excepting the sutural, but specimens do occur with the discal costæ faintly indicated. The punctuation of the thorax is somewhat variable—from a comparatively regular distribution of the punctures to those where it is decidedly irregular and smoother spaces exist. The male antennal club varies a little in length, in some specimens being nearly as long as the stem. The last ventral of the female may have a deep semicircular depression, but every variation from this to an eroded space exists.

This species resembles some of the feebler forms of *corrosa* and *rugosa*, but the sexual characters in either sex will enable them to be separated.

Occurs in Kansas, Colorado, Indian Territory and Texas.

22. **L. prunina** Lec.—Oblong-ovate, facies moderately robust, castaneous to piceous, surface pruinose in well preserved specimens; when the pruinosity is removed the surface is feebly shining. Clypeus broadly emarginate, margin narrowly reflexed, surface densely punctured, the front more coarsely and roughly punctured. Thorax narrowed in front, sides behind nearly parallel, in front oblique, margin coarsely serrate, sparsely ciliate, basal marginal impression indistinct, disc with very coarse (sometimes variolate) punctures, closely placed, dense near the front angles, median line usually smoother. Elytral punctures fine, indistinct, usually sparsely placed, the costæ always moderately distinct. Pygidium finely punctate, nearly smooth in the female. Metasternum densely punctured, the hair moderately long and dense ♂ or sparser and much shorter ♀. Abdomen sparsely indistinctly punctate, the last two segments more coarsely. Claws curved, strongly toothed at middle in both sexes. Last joint of maxillary palpi elongate fusiform, not impressed. Length .67—.74 inch; 17—18.5 mm.

MALE.—Antennal club a little longer than the funiculus. Abdomen flattened at middle, penultimate segment (fig. 27) with a strongly elevated, transverse, rugulose ridge, behind which the segment is

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moderately deeply impressed. Last segment irregularly concave with small granulations, the anterior margin distinctly elevated. Inner spur of hind tibia long, slender and acute, extended in the axis of the tibia; outer spur longer, slender and acute.

FEMALE.—Antennal club shorter than the funiculus. Last ventral segment broadly and moderately deeply emarginate, the disc of segment with an abrupt triangular or oval impression. Posterior tarsi distinctly shorter than in the male.

VARIATIONS.—The pruinosity is easily removed from the surface by immersion in alcohol or from other causes, and the specimens have then quite a different appearance from the others. These are very difficult to determine, except from the male. The thoracic punctuation is normally close and regular, but specimens occur with a decided irregularity in the punctuation.

The sexual characters of *prunina* and *affinis* are practically identical. It is therefore difficult to so describe the non-pruinose specimens of the former that they may be separated from the latter. In *prunina* the form is shorter and more robust, the elytral costæ fairly distinct, the punctuation fine, sparse and indistinct.

With this species I am inclined to unite that described by Burmeister as *fraterna*. The description certainly does not apply to that species, while it seems quite close enough to be applied to a *prunina* deprived of pruinosity.

Occurs from Ohio and Michigan to Kansas, Texas and Alabama.

Group VIII, calceata.

Clypeus moderately deeply emarginate, the border reflexed. Last joint of maxillary palpi fusiform, flattened externally. Antennæ 10-jointed. Posterior tibiæ with the inner spur fixed in the male. First joint of posterior tarsus very short, not longer than half the second, the apex abruptly dilated and prolonged in a process externally in both sexes, although more distinctly in the male. Claws curved, the tooth median, longer in the female. Posterior tarsi ♀ shorter.

At the time this species was described Dr. LeConte suggested that it should probably form a distinct group. The female was then unknown, and he was unable to assign characters common to the two sexes.

The form of the hind femur of the male is known in but one other, *vehemens*, a species allied to *fusca*.

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The only species at present known is the following:

23. **L. calceata** Lec.—Oblong oval, broader behind, subdepressed, castaneous, shining. Clypeus emarginate, more deeply in the female, margin rather widely reflexed, surface closely punctate, front flat, more densely punctate, especially at middle. Thorax widest at middle, slightly narrowed in front, margin more or less serrate, sparsely ciliate, punctures coarse and rather close, denser and finer along the apex, a moderately wide median smooth space and a smaller smooth spot on each side in front of middle, a feeble depression of the basal margin each side. Elytral punctures very much finer and closer than those of the thorax, smoother at apex, sutural costa convex, the first dorsal well developed, broader and more convex posteriorly where it adjoins the sutural, the other dorsal costæ not distinct, submarginal distinct and long. Pygidium sparsely punctate, smoother near the apex. Metasternum densely punctured, the hair long and dense, shorter in ♀. Abdomen moderately coarsely and closely punctate, the last two segments more coarsely. Claws arcuate, the tooth median and strong, longer in the female. Last joint of maxillary palpi fusiform, flattened externally. Length .75—.80 inch; 19—20 mm.

MALE.—Antennal club a little longer than the stem. Abdomen broadly concave at middle, penultimate (fig. 37) segment concave posteriorly, the concavity limited each side by an oblique moderately elevated process which projects slightly over the concavity. Last ventral with a reniform depression. Posterior femur (fig. 15) obtusely subangulate at middle. Inner spur of hind tibia broad and squarely truncate, the outer longer, although broad, acute. First joint of hind tarsus (fig. 15) short, the distal extremity abruptly produced on the outer side. Pygidium convex, broad.

FEMALE.—Antennal club shorter than the funiculus. Posterior femora stout, of the usual form. Spurs of hind tibiæ rather broad. Posterior tarsi shorter than the male, the first joint similar, but with the process less marked. Pygidium more elongate than in the male, the punctuation more regular and distinct.

VARIATIONS.—In the comparatively large number of specimens examined no special variation has been observed. The color does not vary to any extent.

This species has some superficial resemblance to *rugosa*, etc., but the elytra have the smoother sculpture of *fusca*.

Occurs in Texas.

Group IX, fusca.

After having separated all those species possessing well marked structural characters there remain a large number of species of analogous form and structure which constitute this central group of the genus. Many of the species are of common occurrence and

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wide distribution, "presenting the phenomenon of races" which might be supposed to be distinct species if one studied with meagre material. To avoid error from the latter cause it is well to collect as largely as possible from different broods in succeeding years and remote localities. When this is done it will be found that, while there are geographical races, individuals will occur in broods reproducing exactly the usual type of the races from remote localities.

As this group is composed of those species remaining after all those with well defined, usually structural, characters have been removed its characters are more of a negative than positive character.

Body not pubescent above, usually shining, in a few species pruinose or iridescent. Antennæ 10-jointed, the club of the male always longer than that of the female. Clypeus usually emarginate, although at times feebly. Last joint of maxillary palpi fusiform, without impression. Thorax variable in form, the sides sometimes subangulate, the margin often serrate or crenulate. Posterior tibiæ truncate at apex, without trace of sinuation at the base of the fixed spur of the male; this spur usually long, at most feebly curved. Claws strongly toothed at middle, the tooth of the male usually smaller than in the female. Posterior tarsi of female usually shorter than in the male. Last ventral segment large in both sexes.

The homogeneity of the species renders it extremely difficult to separate them in tabular form by any characters sufficiently constant or sharply defined to make their recognition certain. The following is the division proposed by Dr. LeConte, and has been adopted, although some modification of the species admitted in each series has been made for reasons which will be explained.

Clypeus not densely punctured, the margin moderately reflexed, feebly emarginate; lateral margin of thorax not serrate, except in *errans*...Species 24 — 32.

Clypeus densely punctured, the margin at most narrowly reflexed, moderately deeply emarginate; thorax not angulate at the sides, the lateral margin more or less serrate. .....Species 33 — 37.

Clypeus as in the preceding; thorax subangulate at the sides, usually narrower at base than at middle, the margin always more or less serrate. Species 38 — 44.

Species 24—32.

In this series the punctures of the clypeus are well separated and not crowded together, the clypeus is more or less concave, the margin moderately or even widely reflexed, the emargination always feeble. The thorax is narrowed from the base, when viewed from

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above, not subangulate; the margin entire with few exceptions. The sculpture of the surface is never very pronounced; that is, the punctures of the thorax are not conspicuously coarse, nor are the elytral costæ well marked.

The following table will assist in the determination of the species:

Males with the last ventral with a cupuliform depression, the penultimate segment with very feeble characters.
  Form short and robust, larger species..... 24. **crassissima.**
  Form oval, surface slightly pruinose, smaller.....25. **subpruinosa.**
Males without any well defined concavity of the last ventral, the penultimate with a more or less developed transverse or sinuous elevation.
  Thorax strongly serrate, fimbriate with long hair, clypeus with scarcely a trace of emargination.....26. **errans.**
  Thorax not serrate, at most slightly irregular or feebly crenate, the ciliæ short, clypeus distinctly emarginate.
    Penultimate ventral of male with a semicircular, slightly rugulose depression, without any transverse ridge.....27. **inversa.**
    Penultimate ventral of male with a transverse, more or less sinuous ridge in front of the posterior margin of the segment.
      The transverse ridge of the penultimate ventral of the male deeply divided by the median depression of the abdomen. 28. **bipartita.**
      The transverse ridge of penultimate ventral of male entire.
        Surface very conspicuously pruinose ....29. **micans.**
        Surface not at all pruinose.
          Species oblong, depressed, the punctuation of thorax and elytra relatively very coarse .....30. **diffinis.**
          Species larger and of moderately robust facies, the punctuation not conspicuously coarse.
            Fixed spur of male hind tibia long, slightly curved and with a slight hook at tip.....31. **vehemens.**
            Fixed spur of male hind tibia moderate in length, straight. 32. **fusca.**

24. **L. crassissima** Blanch.—Ovate, robust, castaneous or brown, when recent slightly iridescent, shining. Clypeus very feebly emarginate, the margin moderately reflexed, moderately closely punctate, front more densely punctate. Thorax short and broad, convex, narrowed from base to apex, the sides more oblique in front, margin distinctly crenate and ciliate, surface closely, not very coarsely punctate, smoother at the sides, the median line indistinctly smoother, a feeble channel along the basal margin from the hind angles not reaching the middle. Elytra somewhat more coarsely punctured than the thorax, the punctures less dense, surface sometimes slightly rugulose, the costæ usually very indistinct. Pygidium sparsely punctate, indistinctly in male. Metasternum densely punctured, the hair long and dense, shorter in the female; sides of abdomen sparsely punctate, more distinctly in the female. Claws curved, the tooth moderate and slightly intramedian ♂, or stronger and median ♀. Last joint of maxillary palpi slender, fusiform, not impressed. Length .60—.82 inch; 15—21 mm.

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MALE.—Antennal club (fig. 4) a little longer than the stem. Abdomen flattened at middle, the penultimate segment with a feebly elevated, transverse ridge near the posterior border, sometimes merely a slight rugulose convexity, the last segment with a smooth, moderately deep fovea. Inner spur of hind tibia slender, half the length of the outer.

FEMALE.—Antennal club nearly as long as the funiculus. Last ventral segment broadly and moderately deeply emarginate. Pygidium gibbous, and very smooth at apex. Hind tarsi distinctly shorter than the male.

VARIATIONS.—Specimens vary from the normal type of thoracic punctuation in having the punctures rather coarser and less dense and the costæ, especially the first discal, more developed, and the entire surface more rugulose.

This species is one of the most broadly ovate in our fauna, approaching *farcta*, but less ventricose. Recent specimens are probably decidedly iridescent, several in my cabinet show it faintly, but the usual alcoholic collecting seems to deprive the surface of the lustre.

With this species *robusta* and *obesa* must be united; the former was placed among the species with 9-jointed antennæ, but this is purely an error of observation, but the measurement given, .92 inch, is possibly a typographical error.

Occurs from Kansas to Texas.

25. **L. subpruinosa** Casey.—Oval, slightly oblong, castaneous, feebly pruinose, slightly shining. Clypeus very feebly sinuate at middle, the margin moderately reflexed, punctures moderately coarse not dense, frontal punctures slightly coarser and less close. Thorax narrowed from base to apex, sides feebly arcuate, more oblique in front, margin entire, sparsely ciliate, punctures moderately coarse, regularly not closely placed, a slight impression of the base each side. Elytral punctures as coarse as those of the thorax and rather more closely placed, sutural costa distinct, but narrow, the discal costæ scarcely visible, the submarginal faintly indicated. Pygidium convex, smooth and shining, except a few punctures each side ♂. Metasternum densely punctured, the hair moderately long, but not dense. Abdomen sparsely indistinctly punctured, opaque. Claws feebly curved, the tooth quite small and median. Last joint of maxillary palpus fusiform, acute, not impressed. Length .60 inch; 15 mm.

MALE.—Antennal club as long as the stem. Abdomen slightly flattened at middle, penultimate segment slightly gibbous at the middle of the posterior border and somewhat granulate. Last segment with a smooth cupuliform depression, slightly emarginate at apex. Inner spur of hind tibia two-thirds the length of outer, both slender.

VARIATIONS.—Eight specimens have been seen not differing even in color.

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This species has much the form and size of *comans*, but differs in important structural characters. A careful study shows that it must be associated with *crassissima*, although of very much less robust facies.

Taken near Jacksonville, Florida, by the late Edward Tatnall.

26. **L. errans** Lec.—Oval, slightly oblong, moderately robust, rufocastaneous to brown, shining. Clypeus very nearly entire, concave, the border rather widely reflexed, the surface coarsely and moderately closely punctate, front more coarsely and densely. Thorax arcuately narrowed from base to apex, the margin serrate and fimbriate with long hairs, the punctuation coarse and deep, very regularly placed and moderately close, a feeble basal channel. Elytral punctuation less coarse than the thorax and closer, rugulose, especially along the suture, sutural costa narrow, the discal costæ very faint or wanting, submarginal very faint, border of elytra with long fimbriæ. Pygidium moderately coarsely, but not closely punctate. Metasternum densely punctured, the hairs long and dense in both sexes. Abdomen sparsely punctate, the last two segments more coarsely. Claws curved, the tooth median, small ♂, strong ♀. Last joint of maxillary palpi fusiform, not impressed. Length .60—.75 inch; 15—19 mm.

Male.—Antennal club equal to or longer than the stem. Abdomen flattened at middle, penultimate segment (fig. 32) with a strongly elevated arcuate carina arching anterior to the middle of the segment. Last segment flat. Inner spur of hind tibiæ slender and acute, two-thirds as long as the outer, which is slender.

Female.—Antennal club shorter than the funiculus. Last segment with an impression along the apical border, which is broadly emarginate. Legs, especially the posterior, stouter than in the male, the hind tarsi shorter.

Variations.—The color of this species varies but little. The sculpture may be comparatively smooth or quite rugulose. This seems to depend on locality, those from the south of California are smoother than those from the north or from Oregon, while the Nevada specimens are quite rugulose.

The antennæ show a decided tendency to vary in the number of the joints. While the majority of the males are 10-jointed, a specimen in my cabinet has nine joints on one side. Four females are before me, all of which have 9-jointed antennæ produced by the coalescence of the third and fourth joints without trace of suture.

The club of the male antennæ varies in length, sometimes barely as long as the stem, in others very distinctly longer. In these latter, as if by compensation, the arcuate ridge of the penultimate ventral is less strongly elevated.

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This is one of the striking illustrations of the uncertainty resulting from describing species from unique examples.

Occurs in Oregon, California and Nevada.

27. **L. inversa** n. sp.—Oblong oval, scarcely broader behind, rufocastaneous to brown, moderately shining. Clypeus very feebly emarginate, the border moderately reflexed, surface shining, moderately closely punctate, front somewhat more closely punctate. Thorax rather short and convex, sides nearly parallel behind, arcuately narrowing to the front, the margin usually entire, with few ciliæ, the surface with moderately coarse punctures not closely placed (as in *fusca*), the basal marginal groove distinct, but feebly impressed. Elytral punctures as coarse as those of the thorax and more closely placed, distinctly rugulose along the middle, the discal costæ very feeble, the submarginal barely indicated. Pygidium sparsely vaguely punctate. Metasternum densely punctate, the hair moderately long and dense, but shorter in the female. Abdomen sparsely punctate, the last two segments more coarsely. Claws curved, the tooth median, not large ♂, larger in ♀. Last joint of maxillary palpi fusiform, not impressed. Length .60—.72 inch; 15—18 mm.

MALE.—Antennal club nearly as long as the stem. Abdomen rather broadly impressed, the penultimate segment (fig. 34) with a semicircular, somewhat rugose depression, usually surrounded by a finely raised line. Last segment broadly transversely impressed, a faint longitudinal impression, the apex faintly bisinuous. Inner spur of hind tibia broad, short and obtuse, the outer longer and more slender.

FEMALE.—Antennal club small and lenticular, shorter than the funiculus. Pygidium much more elongate than the male and more convex at tip. Hind tarsi distinctly shorter.

VARIATIONS.—While some specimens are comparatively smooth, others are somewhat rugulose. The punctuation of the thorax varies from that in which the punctures are separated by very little more than their own diameter to that where the punctuation is as distant as in the ordinary forms of *fusca*. The color variation is that common to all the fuscous species.

The semicircular impression of the penultimate ventral of the male extends from the posterior border slightly in front of the middle. When the elevated line bordering it is well marked the fossa seems deeper.

In facies this species resembles the smaller forms of *fusca* as well as *bipartita* and the ventral characters of the male afford the only certain means of separating them.

Occurs in Kentucky, Illinois, Kansas, Nebraska and Texas.

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28. **L. bipartita** n. sp.—Oblong, slightly oval, castaneous to piceous, moderately shining. Clypeus broadly, but feebly emarginate, margin moderately reflexed, the punctures coarse and rather close, front more coarsely and densely punctured. Thorax moderately convex, narrower in front, sides posteriorly nearly straight and parallel, anteriorly arcuately and obliquely narrowing to the front, the margin crenate and with short ciliæ, the punctures coarse and moderately close, near the sides somewhat larger and more distant, median line usually smooth, a slight impression of the basal margin each side. Elytral punctures as coarse and close as those of the thorax, indistinct and rugulose each side of the suture, the sutural and first discal costæ fairly distinct, the others very indistinct or entirely wanting. Pygidium sparsely indistinctly punctate. Metasternum densely punctured, the hair moderately long and dense, less dense in ♀. Abdomen sparsely punctate. Claws arcuate, the tooth median and strong in both sexes. Last joint of maxillary palpi very slightly fusiform, not impressed. Length .60—.75 inch; 15—19 mm.

MALE.—Antennal club as long as the stem. Abdomen slightly longitudinally impressed at middle, penultimate segment (fig. 26) with a moderately acutely elevated, transverse carina at middle divided into two parts by the longitudinal impression, an acute emargination of the posterior edge of the segment closed with membrane, last segment slightly concave, a faint longitudinal impression, with few granules, the apical border acutely emarginate. Inner spur of hind tibiæ half the length of the outer and not stouter.

FEMALE.—Antennal club shorter than the funiculus. Last ventral segment sinuate each side of middle so that the middle portion projects in the form of a broad triangular tooth. Hind tarsi slightly shorter than the male.

VARIATIONS.—The median smooth space of the thorax is not always distinct. The elytral costæ may vary in distinctness, but not to any great degree. In the male the transverse ridge of the penultimate ventral varies in development, so that at times the free edge projects in the form of an overhanging lobe. This is the only species known to me in which the penultimate segment is formed in this manner.

Occurs in Kansas, Louisiana and Texas.

29. **L. micans** Knoch.—Oblong, slightly broader behind, brownish-black, surface with a pruinose coating and consequently opaque. Clypeus concave and feebly emarginate, the border moderately reflexed, surface rather coarsely not very closely punctate, front similarly punctate. Thorax nearly parallel behind, arcuately narrowed in front, margin entire or sometimes slightly crenate posteriorly, basal marginal channel feeble, surface with moderate punctures, sparsely and somewhat irregularly placed, median line smoother, the punctures somewhat finer near the apex than at base. Elytra punctured similarly to the thorax, the punctures equal in size and not very closely placed, sutural costa distinct, also the first discal, the others indistinct or wanting. Pygidium opaque, shining at

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apex, the punctures coarse but indistinct. Metasternum densely punctured, the hair moderately long and dense, very little shorter in the female. Abdomen pruinose, with sparse fine punctures each bearing a short hair. Claws arcuate, the tooth median, moderate in the male, large in the female. Last joint of maxillary palpi fusiform not impressed. Length .59—.68 inch; 15—17 mm.

MALE.—Antennal club shorter than the stem. Abdomen flattened at middle, penultimate segment with a feebly elevated, arcuate ridge at middle. Last segment irregularly concave. Inner spur of hind tibia half the length of the outer, slender and slightly curved outwardly, outer spur slender and long.

FEMALE.—Antennal club shorter than the funiculus. Last segment of abdomen often slightly concave or with a transverse depression, usually convex, and either smooth or sparsely punctate. Pygidium more convex at apex. Posterior tarsi very distinctly shorter than the male.

VARIATIONS.—For a species with so wide a distribution the variation is very slight. The color is is some specimens rufescent, but this is merely immaturity. In a few specimens the front may be nearly smooth at middle. As a general rule the specimens from the northern regions are longer and more parallel, those from the south shorter and more robust. When the pruinose coating is removed, the punctures become apparently longer and more distinct.

The form of the fixed spur of the hind tibia of the male is very like that seen in *comans*.

The species determined as *micans*, by Blanchard, and placed among those with 9-jointed antennæ is really *prununculina*.

Occurs from Massachusetts to Missouri, and to Georgia and Louisiana.

30. **L. diffinis** Blanch.—Oblong, nearly parallel, rather depressed, rufo-ferruginous, shining. Head rather broad, eyes large. Clypeus faintly sinuate at middle, margin moderately reflexed, surface with coarse and deep, sparse punctures. front sparsely punctate at middle, more closely near the eyes. Thorax rather short, widest at middle, very slightly narrowed to base, sides anteriorly arcuately narrowed to front. margin slightly irregular not crenate, with short ciliæ, disc feebly convex, the punctures coarse, rather sparsely placed, but closer near the sides, a very faint basal marginal groove. Elytra with very coarse and rather closely placed punctures, surface somewhat rugulose, the first discal costa faintly indicated, the submarginal entirely wanting. Pygidium with coarse, indistinct punctures, somewhat rugulose near the apex. Metasternum densely punctate, the hair moderately long and dense. Abdomen at sides sparsely finely punctate, the second and last two more coarsely. Claws feebly curved, the tooth small and median ♂. Last joint of maxillary palpi fusiform, not impressed. Length .60 inch; 15 mm.

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MALE.—Antennal club slightly longer than the stem. Abdomen flattened at middle, penultimate segment with a straight transverse ridge near the posterior margin, along which the segment is impressed. Last segment vaguely concave and smooth. Inner spur of hind tibia half the length of the outer and acute.

VARIATIONS.—Two males are before me which agree in all particulars, except that one has the antennal joints so confused that but nine can be counted; in the other specimen the antennæ are normally ten-jointed.

This species is rather more slender and depressed than usual in this group, and the punctuation of both thorax and elytra notably coarse. The male ventral characters are not unlike those of the usual form of *fusca*.

Two specimens; Duval Co., Florida, and eastern Kentucky.

31. **L. vehemens** n. sp.—Oblong-oval, moderately robust, fuscous to piceous, shining. Clypeus slightly emarginate, somewhat concave, margin moderately reflexed, surface rather coarsely, moderately closely punctate; front similarly punctured. Thorax narrowed from the base, sides posteriorly nearly straight, anteriorly arcuate, margin entire, with short ciliæ, disc moderately convex, the punctures relatively small and sparse, the median line smooth behind, a feeble basal marginal sulcus from the hind angles. Elytra with punctures similar to those of the thorax, but indistinct, except at base and sides, at middle rugulose, sutural costa rather narrow, the discal costæ feeble, the submarginal well developed and nearly reaching the humerus. Pygidium sparsely indistinctly punctate, the punctures rather fine. Metasternum densely punctured, the hair moderately long, but dense. Abdomen sparsely indistinctly punctate, the last two segments more coarsely. Claws curved, the tooth median and strong, a little longer in the female. Maxillary palpi rather stout, the last joint fusiform, not impressed. Length .84—.86 inch; 21.5 mm.

MALE.—Antennal club not as long as the stem. Abdomen broadly flattened and slightly concave, the penultimate segment (fig. 29) with an arcuate ridge, projecting in the manner of a ledge, behind which the segment is slightly concave and smooth. Last segment broadly transversely impressed, the apex broadly emarginate. Posterior femur broadly angulate at middle. Inner spur of hind tibia long, somewhat curved and slightly hooked at tip, outer spur slender.

FEMALE.—Antennal club shorter than the funiculus. Penultimate ventral segment transversely impressed near the posterior border. Last segment broadly emarginate. Posterior femur not angulate, hind tarsi slightly shorter than the male.

VARIATIONS.—Nothing has been observed in the small number seen beyond color.

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The two males before me show a curious structure, which must for the present be considered a monstrosity. The outer anterior claw has an additional small tooth between the usual tooth and the apex, on one side midway (fig. 9a), on the other close to the base of the tooth (fig. 9b); this in one male. In the second male both claws of the left side are normal, while the outer claw of the right side has the tooth midway (fig. 9c) as in the other male. The claws of the other legs are normal, as are those of the female. The maxillary palpi are stouter than I have observed in any other species.

This species so closely resembles the larger forms of *fusca* as to be with difficulty distinguished, except by the sexual characters and the stouter palpi.

Collected in Kansas by Prof. F. H. Snow.

32. **L. fusca** Fröhl.—Form usually oblong, although somewhat variable, rufocastaneous, brown or piceous, shining. Clypeus slightly emarginate, the border moderately reflexed, surface moderately closely punctate, front usually a little more coarsely and less closely punctate. Thorax always widest at base, usually arcuately narrowed to the apex, margin entire with short ciliæ, surface variably punctate, never very coarsely nor very closely, usually with a smooth median line, basal channel wanting. Elytra more closely punctate than the thorax, the costæ variable, sometimes fairly distinct or again entirely obliterated, the submarginal always distinct posteriorly. Pygidium usually punctate, sometimes coarsely, sometimes more finely, always sparsely. Metasternum densely punctured, the hair long and dense, a little shorter in the female. Abdomen shining, sparsely punctate, the last two segments more coarsely. Claws curved, the tooth median, always stronger in the female. Last joint of maxillary palpi ovate, not impressed. Length .70—.95 inch; 17.5—23.5 mm.

MALE.—Antennal club as long as the stem, or very little longer. Abdomen flattened at middle, penultimate segment with a transverse ridge near the posterior border, variably elevated, sometimes very sinuous (figs. 30, 31). Last ventral feebly concave. Inner spur of hind tibiæ two-thirds the length of the outer and slender.

FEMALE.—Antennal club small, much shorter than the funiculus. Last ventral segment broadly emarginate at apex. Pygidium more elongate than the male, more shining, the punctures more sharply impressed. Hind tarsi distinctly shorter.

This species as here defined is probably the most widely distributed of any in our fauna, and at the same time the most abundant wherever it occurs. We observe, therefore, geographical races, and within these races individual variations which are brought into prominence in most collections by being preserved, while the typical forms are rejected. As a general rule the southern specimens are larger, more

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robust and more dilated behind. The Middle States specimens are oblong and nearly parallel. Those from the Hudson's Bay region southward to Colorado and west to Washington Territory, are of somewhat shorter form and more obtuse in front. These remarks must be accepted in the most general sense as every manner of intermediate forms occurs.

In his "Review" Dr. LeConte has suggested a number of races based on the general form of the specimens, but as these were founded on one, or at most two specimens in each case, sometimes on a male or again on a female, they must be considered of no more value than as types of individual variation.

One character, however, requires explanation. His second race is based on a "male with the ungual tooth short" in contradistinction to the others in which the males have a "long tooth on the claw." These distinctions are purely relative. In all cases where the same brood is examined, the males have always a tooth slightly shorter than the female, although the difference is never so marked as in *micans*, for example.

After an examination of vast numbers of specimens from all parts where it occurs certain differences have been observed in the ventral characters of the male which seem to indicate three races.

The most common form of the Middle States region, probably the same as those seen by Froehlich have the male as follows:

Race *fusca*.—Penultimate segment impressed along its posterior border, in front of which is a feebly elevated, slightly arcuate, obtuse ridge, the last ventral segment transversely impressed and with a few small granules.

Race ————.—Carina of penultimate ventral more elevated, more arcuate at middle, the edge of the carina slightly free, that is, the segment is slightly excavated behind the carina so that the edge of the carina is slightly overhanging, the last segment slightly concave, nearly smooth.

Race ————.—This is merely an exaggeration of the preceding, the edge being still more projecting.

Specimens of these three forms may be readily selected, but there is every intergrade. The greatest number of individual or geographical variations seems to occur in the form with the feebly elevated carina on the penultimate ventral. The first well marked geographical variety has been described as

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L. cephalica Lec.—Color ferruginous brown or pale castaneous, form a little shorter than typical *fusca*. Elytral costæ moderately well defined, especially the first discal.

The characters used by Dr. LeConte to define this as a species vanish entirely. He described from one specimen, while there are now sixteen before me. An extreme form might be selected which would readily pass as distinct from typical *fusca*.

These forms occur at Hudson's Bay, Idaho, Colorado, Kansas, Utah, Washington Territory and Northern California.

It seems hardly necessary to dwell in any detail on those variations in which the sides of the thorax behind the middle are either parallel or slightly convergent to the front, nor on those where the thorax is apparently slightly narrower than the elytra. There is variation in the size of the punctures of the thorax as well as in their closeness, but not as striking as in many other species.

The elytral costæ are usually feebly developed, but specimens are quite frequent in which all the costæ are fairly indicated. At this point it is well to note that nearly all the variations from the typical form are females and these attain the greatest development as to size. Specimens of this sex are seen from North Carolina and Georgia in which the elytra are comparatively smooth, but not shining, the sutural stria so faint that the sutural costa seems merely an elevation of the suture.

In fact so variable is *fusca* and so evanescent the differences that I know of no better task than the study of a *large* series of this species for those to whom differences mean specific distinction.

As may be inferred from the preceding remarks *fusca* is very widely distributed. It occurs in the Hudson's Bay region through Canada to Maine, southward to northern Georgia, thence northwestwardly to Kansas, Colorado, Utah, Idaho, Nevada, Washington Territory and the north of California.

Species 33 — 37.

The clypeus is here either flat or slightly transversely convex, the margin scarcely or very narrowly reflexed, moderately deeply emarginate, the punctuation always very dense. The thorax is more angulate at the sides, the margin more or less serrate or crenate in all the species.

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The species are as follows:

Surface very shining, as if varnished, the elytral costæ entirely obliterated, thorax with very large impunctured spaces .....33. **politula.**

Surface of usual aspect, costæ more or less distinct.

Submarginal costa of elytra well marked, reaching very nearly the humeral umbone.

Thorax equally punctate, but not conspicuously coarse..... 34. **barda.**

Thorax with scattered coarse punctures, with smooth spaces of variable size .....35. **marginalis.**

Submarginal costa very feeble, visible only at apical third.

Antennal club ♂ longer than the entire stem; last ventral not cupuliform. .....36. **spreta.**

Antennal club ♂ very little longer than the funiculus; last ventral with cupuliform fovea.....37. **fraterna.**

Two of the species, *marginalis* and *fraterna*, are variable in thoracic sculpture, and reference must be made to the details under the descriptions.

33. **L. politula** n. sp.—Oblong, nearly parallel, rufocastaneous, surface very smooth and shining. Clypeus moderately deeply emarginate, the border narrowly reflexed, coarsely, cribrately punctured, front very coarsely punctured, but not cribrate. Thorax narrowed in front, sides arcuate, margin crenate, with short ciliæ, surface very shining, with coarse umbilicate punctures sparsely placed near the side, others smaller irregularly scattered each side of the median line and along the apex, having a large smooth space each side. Elytral punctures much finer than those of the thorax, moderately closely placed, except near the apex, surface as if varnished, the costæ entirely obliterated, the sutural stria nearly entirely effaced, the suture scarcely more convex. Pygidium polished, a few scattered punctures near the side. Metasternum rather coarsely and closely punctured, the hair rather short and sparse ♀. Abdomen moderately closely punctured at the sides, the last two segments more coarsely. Claws curved, with a strong median tooth ♀. Last joint of maxillary palpi cylindrical, truncate, not impressed. Length .71 inch; 18 mm.

The female has the antennal club a little shorter than the funiculus. Penultimate ventral segment transversely impressed close to the posterior border. Pygidium broader than long, feebly convex. Of this species I have seen but one female remarkable in the polished surface and the entire obliteration of the elytral costæ. It cannot be mistaken for *nitida*, as the latter has 9-jointed antennæ and the pygidium gibbous near the apex. The thoracic sculpture is quite different in the two species.

One specimen, locality unknown, given me by the late Chas. Wilt.

34. **L. barda** n. sp.—Oblong-oval, rather robust, above slightly depressed, piceous, shining. Clypeus distinctly emarginate, the border very slightly reflexed, densely punctured, the front more coarsely but less densely punctured. Thorax moderately convex, sides posteriorly straight, but slightly convergent to

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the front, anteriorly broadly arcuate, margin entire with short ciliæ, disc moderately coarsely and rather closely punctured, median line smooth for a short distance, basal channel moderately well defined. Elytra less coarsely punctured than the thorax, but more closely, somewhat rugulose along the middle, smooth at sides of apex, sutural costa as usual, the first discal moderately distinct, especially in the female, the other costæ obliterated, submarginal costa well developed, usually extending two-thirds to base. Pygidium dissimilarly punctured in the sexes. Metasternum densely punctured, the hair of moderate length, not dense, much shorter in the female and sparser. Abdomen moderately closely punctate at the sides, each puncture bearing a short hair, the last two segments, especially in the female, conspicuously more coarsely punctate. Claws with a median tooth, small in the male, long in the female. Last joint of maxillary palpi fusiform, not impressed. Length .82—.86 inch; 21—22 mm.

MALE.—Antennal club a little shorter than the stem, piceous. Abdomen flattened at middle with a faint median linear impression, penultimate segment impressed along its posterior margin, at middle a feebly elevated, sinuous, transverse carina. Last segment feebly concave, a fine median linear impression. Pygidium a little broader than long, the punctures coarse but not deep, the surface irregular. Inner spur of hind tibia slender, two-thirds as long as the outer.

FEMALE.—Antennal club brown, much shorter than the funiculus. Penultimate ventral segment arcuately impressed at middle. Last segment broadly, but feebly emarginate. Pygidium somewhat conical, more protuberant near the apex, the punctures coarse and close along the middle, sparser near the sides.

VARIATIONS.—The three specimens before me agree in color and differ only in the distinctness of the elytral costæ, the male being smooth.

This species is difficult to place by means of any tabular division. It seems nearly intermediate between some of the more rugose forms of *fusca* and the species of the present sub-group in the form of the clypeus and its sculpture. The presence of a well defined channel along the base of the thorax inclines me to place it here rather than with *fusca*. From the latter, which it resembles in form, it differs in its generally coarser punctuation, the thorax being more coarsely and closely punctate than ever occurs in *fusca*.

The form of the tooth of the male claws deserves especial mention. The claw is feebly curved, the tooth rather small and median, formed nearly like the tooth of a saw; that is, the distal edge forms a right angle with the edge of the claw, while the inner border is very obtuse.

Three specimens, North Carolina (Morrison).

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35. **L. marginalis** Lec.—Oblong, very little broader behind, rufocastaneous to brown, shining. Clypeus moderately emarginate, the border very narrowly reflexed, deeply and moderately coarsely punctured, front more coarsely and deeply punctured. Thorax broadest at base, sides arcuately narrowed to the front, margin slightly irregular but not crenate, with short ciliæ, surface shining, the punctures very coarse, sparsely and irregularly placed, having large smooth spaces on each side slightly in front of the middle, basal marginal groove feebly distinct each side. Elytral punctures rather fine, moderately closely placed, the costæ distinct, but narrow and feebly elevated, the submarginal costa well developed posteriorly in all specimens and in most of them extending to the humeral umbone. Pygidium sparsely punctate, smoother at apex. Claws arcuate, strongly toothed at middle. Last joint of maxillary palpus fusiform not impressed. Metasternum densely punctured, the hair of moderate length, in the female shorter and sparser. Length .65—.85 inch; 16.5—21.5 mm.

MALE.—Antennal club a little longer than the stem. Abdomen flattened at middle, the penultimate segment (fig. 28) with a semicircular rugulose elevation in front of a moderately deep, smooth fovea. Last ventral segment vaguely longitudinally impressed. Inner spur of hind tibia shorter than the outer and usually stout, the outer spur long and slender.

FEMALE.—Antennal club shorter than the funiculus. Penultimate ventral segment slightly impressed along the posterior border. Hind tarsi a little shorter than the male. Pygidium slightly protuberant near the apex.

VARIATIONS.—The punctuation of the thorax varies greatly. The typical form has the punctures very sparsely placed, but so arranged as to have a smooth transverse space on each side in front of the middle, but specimens occur in which the area of the surface absolutely smooth is greater than that with punctures. On the other hand the punctures may be more abundant, so that the smooth space is only vaguely indicated, as in *rugosa*. Three specimens of the larger size (.80 inch) have the sides of the thorax distinctly crenate, but there is every degree from this to those in which the margin is slightly irregular. A specimen ♀ from Tennessee has the thorax very coarsely and rather closely punctured, the punctures larger than known to me in any other species. Without the male I am unwilling to consider it distinct, and for the present place it as an extreme variety.

Occurs from New York to Wisconsin and Illinois (southward to Tennessee?).

36. **L. spreta** n. sp.—Oblong, elytra slightly wider at middle, castaneous or fuscous, shining. Clypeus feebly emarginate, margin very narrowly reflexed, densely and moderately coarsely punctured, front rather more coarsely but less

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densely. Thorax narrower in front, sides posteriorly nearly parallel, in front oblique, the margin entire, with short distinct ciliæ, disc moderately convex, the punctures small, sparsely but equally placed, a slight depression of the base on each side. Elytral punctures equal to those of the thorax, more closely placed, surface slightly rugulose on each side of the suture, the costæ distinct but feebly elevated, the submarginal distinct posteriorly. Pygidium sparsely punctate, smoother near the apex. Metasternum densely punctate, the hair moderately long and close; sides of abdomen with sparse punctures bearing short hairs. Claws curved, the tooth moderate in size and median ♂. Last joint of maxillary palpi short, fusiform, not impressed. Length .66—.72 inch; 16.5—18 mm.

MALE.—Antennal club nearly a third longer than the entire stem. Abdomen slightly flattened at middle, penultimate segment with a short, feebly elevated, transverse ridge a short distance in front of the posterior margin. Last segment very slightly concave. Inner spur of hind tibia two-thirds the length of the outer and broader.

VARIATIONS.—The two male specimens before me do not vary, except slightly in color and size.

In this species the clypeus is more feebly emarginate than usual in those with the punctures of its surface dense and the border narrowly reflexed. On the other hand the antennal club of the male is unusually long, exceeding that of any species of the *fusca* group. The facies and sculpture are very like a small *fusca*.

Occurs in Maryland and Iowa.

37. **L. fraterna** Harris.—Oblong, scarcely broader behind, rufotestaceous, fuscous or piceous, shining. Clypeus moderately emarginate, the border narrowly reflexed, surface densely punctured, the front more coarsely less densely. Thorax gradually narrowed from base to apex, the sides feebly arcuate, the margin entire or slightly irregular, rarely slightly crenate, a slight impression of the middle of the base each side, surface variably punctured, the punctures moderate in size, never very coarse. Elytral punctures finer than those of the thorax, more closely placed, somewhat rugulose each side of the middle, the costæ usually very feeble, the submarginal feebly distinct posteriorly. Pygidium sparsely finely and indistinctly punctate. Metasternum densely punctured, the hair not long nor dense, shorter in the female. Abdomen sparsely punctate at the sides, the last two segments more coarsely. Claws curved, the tooth strong and median. Last joint of maxillary palpi fusiform, not impressed. Length .59—.70 inch; 15—18 mm.

MALE.—Antennal club equal to or slightly longer than the funiculus. Abdomen slightly flattened at middle, penultimate segment impressed at middle and slightly granulate, a feeble oblique tuberosity each side. Last segment deeply concave and smooth, the apex slightly emarginate. Inner spur of hind tibiæ moderately long, shorter than the outer, but less slender.

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FEMALE.—Antennal club shorter than the funiculus. Penultimate ventral segment with a linear impression close to and parallel with the hind margin. Hind tarsi slightly shorter than the male.

VARIATIONS.—Apart from the usual color variation the most striking is the punctuation of the thorax. The kinds of variation may be best explained by accepting as races the various forms which it seems necessary to aggregate under one common name. It must not, however, be inferred that the races are sharply defined, as there is every intergrade in the numerous specimens examined and in the large series now before me.

L. fraterna Harr.—Thoracic punctures moderately coarse, sparse and somewhat unequal in size, more closely placed near the sides, median line smoother. Lateral margin usually entire. As a rule the elytral costæ are very feeble.

This is the form most common from Maryland northward.

L. cognata Burm.—Thoracic punctures coarse, but equal in size, more sparsely placed at middle and closer at the sides, with a tendency observed to form smooth spaces on each side. The lateral margin is irregular, sometimes feebly crenate. Elytral sculpture somewhat more pronounced as to the costæ and slightly rugulose.

This race is the more abundant south of Maryland. *L. lutescens* Lec., is intermediate between this race and the next.

L. Forsteri Burm. (lugubris *Lec.*)—Punctures as coarse as in *cognata*, but widely distant on the disc, having large smooth spaces on each side in front of the middle as well as along the base, this style of sculpture recalling the normal form of *marginalis*. The lateral margin is usually irregular, rarely feebly crenate. Elytral sculpture as in *cognata*. In this race it is more often observed that the head and thorax are nearly piceous in color, while the elytra are reddish-brown.

The habitat of this species, although parallel with the two preceding, is more inland, although I have specimens from New Jersey, specimens otherwise are from western New York to North Carolina and Tennesse, extending westward to Iowa.

L. semicribrata Lec.—The punctures are still larger than in *Forsteri*, deeper and more widely scattered. The elytral punctures are also somewhat coarser, but the costæ are feeble.

Of this form I have seen two specimens ♂ and ♀ the locality of which is uncertain, but probably Georgia.

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The species as defined above occurs from Maine to Iowa, southward to North Carolina and possibly Georgia.

Species 38 — 44.

In this series the clypeus is flat, deeply emarginate, margin narrowly reflexed, surface very densely punctured. The thorax is obtusely angulate at the sides, narrowed toward the base as well as the apex, the margin serrate. The elytral costæ are well marked, except in *scitula* and *infidelis*. The thoracic punctuation is usually coarse.

The species are difficult to separate, but the following sketch will assist:

Fixed spur of hind tibiæ ♂ very short; thorax not rugose, the elytra without costæ ..... 38. **infidelis.**

Fixed spur of hind tibiæ ♂ of normal length, or even as long as the free spur.

Penultimate ventral ♂ with a transverse, more or less rugose elevation.

The transverse elevation in the form of a ridge a little in front of the posterior border; last ventral depressed, with granular elevations; fixed spur of male very long..... 39. **luctuosa.**

The transverse elevation formed by the apparent thickening or elevation of the posterior border of the penultimate segment: fixed spur shorter than the outer ..... 40. **corrosa.**

Penultimate ventral ♂ broadly impressed at middle, forming an oblique declivity, on each side of which is an obtuse elevation.

Thorax densely and confluently punctured.

Elytral costæ entirely obliterated; form rather elongate; punctures of thorax with a tendency to become transversely confluent. 41. **scitula.**

Elytral costæ feeble, but distinct; form rather robust; thoracic punctures irregularly confluent. ..... 42. **Knochii.**

Thoracic punctures coarse and close, but not confluent; costæ of elytra moderately distinct, the submarginal distinct in apical half.

Punctures of thorax dense and regularly placed, the disc not very convex..... 43. **profunda.**

Punctures of thorax close, but somewhat irregular, the disc moderately convex..... 44. **rugosa.**

38. **L. infidelis** n. sp.—Oblong-oval, broader behind, convex, chestnut-brown, head and thorax darker, shining. Clypeus moderately deeply emarginate, rather more acutely in the female, margin narrowly reflexed, rather coarsely densely punctured, front less densely punctured. Thorax distinctly narrower in front, sides obtusely angulate, widest at middle, narrowed to base, more obliquely narrowed in front, margin irregular, scarcely crenate, sparsely ciliate, disc convex, the punctures moderately coarse not closely placed, slightly irregular in distribution, an indistinctly defined, smooth, median space, a distinct depression of the basal margin externally. Elytra gradually wider from the humeri, the punctures finer than those of the thorax, moderately close near the base,

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gradually more sparse toward the apex, sutural costa well marked, the others entirely wanting. Pygidium moderately coarsely not closely punctate. Metasternum moderately coarsely and closely punctate, the hair rather sparse, not long ♂, shorter and sparser ♀. Claws arcuate, strongly, equally toothed at middle in both sexes. Last joint of maxillary palpus fusiform, not impressed. Length .75—.82 inch; 19—21 mm.

MALE.—Antennal club nearly as long as the stem. Abdomen sparsely finely punctate at the sides, the last two segments more coarsely, at middle flattened, the penultimate segment slightly depressed along the posterior border at middle, the last segment slightly concave. Inner spur of hind tibia very short, the outer long and slender. Pygidium convex, the punctures coarser.

FEMALE.—Antennal club shorter than the funiculus. Abdomen at sides more coarsely punctured. Pygidium more elongate, the punctures less coarse, but more impressed. Posterior femora stouter, spurs of hind tibiæ slender. Tarsi not shorter than the male. Last ventral segment broadly emarginate at apex.

VARIATIONS.—In quite a large series no variation occurred, except in color.

As is usual in species of rather dark color the legs, especially the femora, have a reddish color. The surface is rather more shining than in any other species of this series, except *nitida*. The inner spur of the male hind tibia is as short as in some of those of the *ephilida* group, so that a strict interpretation would place the present species there, but the entire facies indicates its position here.

Occurs in Georgia (Morrison) and Florida (H. A. Kelley).

39. **L. luctuosa** n. sp.—Oblong-oval, broader behind, convex, the ♀ slightly ventricose, dark brown or piceous, moderately shining. Clypeus slightly emarginate, the border narrowly reflexed, coarsely and closely ♂ or densely punctate ♀, front more densely punctate than the clypeus ♂ or cribrate ♀. Thorax rather short, very obtusely subangulate at middle, sides almost rounded, very little narrower at apex than base, the margin distinctly crenate with short ciliæ, disc convex, the punctures very coarse and close, a dense group near the front angles, a feebly indicated smooth median line, a very feeble basal channel externally. Elytra gradually broader from the humeri, convex, the punctuation much finer than on the thorax, moderately dense, slightly rugulose, smoother near the apex; sutural costa normally distinct the first discal usually slightly distinct, the others absent, submarginal faintly indicated. Metasternum moderately coarsely closely punctate, the hair short, sparse ♂, nearly naked ♀. Pygidium sparsely punctate, smoother near the apex. Abdomen sparsely punctate at the sides, more finely in the ♂, the last two segments more obviously coarsely punctured in the male. Claws curved, strongly and equally toothed at middle in both sexes. Last joint of maxillary palpus fusiform, not impressed. Length .79—.87 inch; 20—22 mm.

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MALE.—Antennal club very little longer than the funiculus. Abdomen flattened at middle, the penultimate segment depressed along its posterior border, in front of which is a transverse, obtuse ridge slightly interrupted at middle. Last ventral with the anterior border slightly elevated, a reniform depression containing small granular rugæ. Spurs of hind tibiæ equal in length, very long, slender and acute.

FEMALE.—Antennal club shorter than the funiculus. Spurs of hind tibiæ less elongate and rather wider. Pygidium more elongate, slightly gibbous near the apex. Posterior femora stouter, the tarsi equal to the male. Last ventral segment (fig. 22) broadly and deeply emarginate, the face of the segment with a deep, irregularly triangular depression.

VARIATIONS.—The color ranges from castaneous to piceous. The form varies, being somewhat more ventricose in specimens regardless of sex. In the males the sides of the clypeus have the appearance of being convergent to the front, while in most of the females the sides are strongly arcuate, although a few have the same form as the male.

This species has a similar form to *infidelis*, but is more robust, and while the latter has the fixed spur unusually short, this one has it unusually long and slender, in fact as long as the free spur, a character of very unusual occurrence.

Occurs in South Carolina, Georgia, Fla., Alabama and Louisiana.

40. **L. corrosa** Lec.—Oblong-oval, slightly broader behind, form rather robust, castaneous or brown, head usually darker, moderately shining. Clypeus rather broadly emarginate, the border narrowly reflexed, very closely, rather coarsely punctate, front more coarsely punctate, almost cribrate. Thorax widest at middle and very obtusely angulate, slightly narrowed to base, more obliquely in front, margin serrate, more distinctly behind the middle, sparsely ciliate, disc convex, the punctures coarse, variolate, moderately closely placed, except each side of middle where they are sparser, near the sides densely punctured, median line indistinctly smoother, a depression at the basal margin on each side. Elytral punctures moderately coarse, but not dense, surface somewhat rugulose, sutural costa distinct, first discal feeble, the others very indistinct, submarginal well developed. Pygidium rather sparsely punctate. Metasternum closely punctate, the hairs moderately long, not dense, shorter in ♀. Abdomen sparsely punctate, the last two segments more coarsely. Claws curved, with a strong median tooth rather longer in the female. Last joint of maxillary palpus fusiform and slightly flattened. Length .67—.80 inch; 17—20 mm.

MALE.—Antennal club nearly as long as the stem. Abdomen flattened at middle, penultimate segment (fig. 41) with the posterior border vertical at middle, slightly granulate, the horizontal portion

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of the segment obliquely plicate each side. Last segment vaguely concave, smooth. Spurs of the hind tibiæ slender and acute, the inner one-third shorter.

FEMALE.—Antennal club shorter than the funiculus. Pygidium more elongate, the hind tarsi slightly shorter than the male.

VARIATIONS.—There is no great variation in color in the specimens examined; the sculpture is in some specimens much more rugose than in others.

This species was not placed by Dr. LeConte among those with the sides of the thorax subangulate, for the reason that the smaller series of specimens and the fewer species enabled him to draw the line more closely. It is placed in the present series because the thorax is very distinctly narrowed at base, although the prominence of the sides of the thorax is rather rounded than angulate.

A very close resemblance between this species and *rugosa* exists, so that it is hardly possible to separate the females, the males may be readily distinguished by the ventral characters.

Occurs in Illinois and Texas.

41. **L. scitula** n. sp.—Form rather elongate, elytra widest at middle, chestnut brown, head and thorax somewhat darker, shining. Clypeus rather deeply emarginate, the border moderately reflexed, densely coarsely punctate, front much more coarsely punctate at middle. Thorax broadest at middle and very distinctly angulate, narrowed toward base, sides more oblique in front, apex not much narrower than base, margin crenate, ciliæ short, very densely and moderately coarsely punctate, the punctures subconfluent in a transverse direction, median line posteriorly cariniform, smoother. Elytra nearly elliptical in form, widest at middle, the sutural costa alone distinct, the others entirely obliterated, punctures moderately coarse and close. Pygidium sparsely punctate female, rugose male. Metasternum densely punctured, the hair moderately long and dense in the male, extremely short and sparse in female. Abdomen sparsely punctate at the sides, the last two segments more coarsely. Claws curved, the tooth strong and median. Last joint of maxillary palpus fusiform, not impressed. Length .70—.78 inch; 18—20 mm.

MALE.—Antennal club a little longer than the stem. Abdomen slightly concave at middle, the penultimate segment (fig. 40) with a triangular depression posteriorly, surrounded by an obtusely elevated ridge. Last segment flattened with rugose punctures. Inner spur of hind tibia elongate triangular and very acute, the outer longer, rather broadly translucent at apical half.

FEMALE.—Antennal club shorter than the funiculus. Pygidium more elongate, slightly gibbous near the tip. Posterior tarsi not shorter.

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VARIATIONS.—The few specimens seen show no variation.

The form of this species is more elongate than usual in this part of the series recalling *ignava*, but not so cylindrical. In the female the punctures of the thorax are filled with clay, so that the transverse strigosity becomes evident; in the male the thorax has rather a velvety appearance.

Occurs in Texas.

42. **L. Knochii** Gyll.—Elongate oval, very little broader behind, ferruginous brown to piceous, feebly shining. Clypeus rather broadly and moderately deeply emarginate, the border scarcely reflexed, densely rather coarsely punctate, front nearly cribrate. Thorax widest at middle, subangulate, distinctly narrowed to base, more obliquely narrowed in front, margin crenate, sparsely ciliate, disc densely, coarsely, and at times subconfluently punctate, a distinctly elevated smooth median line, basal margin hardly depressed. Elytral punctures comparatively small and rather closely placed, except near the apex, the sutural and first discal costæ well developed, the others indistinct, the submarginal very feeble. Pygidium moderately coarsely not closely punctate. Metasternum closely punctate, the hair rather short and sparse, in female shorter. Abdomen at sides moderately closely punctate, the last two segments more coarsely. Claws curved, the tooth strong and median, a little longer in female. Last joint of maxillary palpus fusiform not impressed. Length .85—.92 inch; 21.5—23.5 mm.

MALE.—Antennal club a little shorter than the stem. Abdomen slightly flattened at middle, penultimate segment flattened at middle and slightly granulate, on each side a feeble oblique tuberosity. Last segment feebly concave, slightly granular each side, the apex acutely emarginate. Inner spur of hind tibia elongate triangular, the outer longer and more slender.

FEMALE.—Antennal club shorter than the funiculus. Pygidium more elongate, pubescent at apex. Posterior tarsi as long as the male. Femora stouter than the male, especially the posterior.

VARIATIONS.—The usual color is reddish-brown, with the head and thorax a little darker, in these the legs are more reddish in color, and the abdomen paler than the upper surface. One specimen before me is entirely piceous.

This species is one of the largest of the central series of Lachnosterna; this with the very closely punctate thorax with median carina make it easily known.

Occurs from Massachusetts to Georgia, but seems rare.

43. **L. profunda** Blanch.—Oblong, slightly broader behind, moderately robust, shining, castaneous. Clypeus broadly, moderately deeply emarginate, margin narrowly reflexed, moderately coarsely densely punctured, front more coarsely punctured. Thorax widest at middle, obtusely angulate, slightly nar-

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rowed to base, more obliquely narrowed in front, margin crenate, sparsely ciliate, a feeble channel along the basal margin externally, coarsely and closely punctate, the punctures denser near the sides, those of the disc umbilicate, median line smooth, feebly elevated. Elytra rugulose at middle, the punctures distinct along the base and sides which are finer than those of the thorax and closely placed, sutural costa well marked, first discal distinct, but not prominent, the other discal costæ obliterated, submarginal distinct posteriorly. Pygidium coarsely not closely punctate. Metasternum densely punctured, the hair moderate in length but not dense. Abdomen sparsely rather finely punctate, the last two segments more coarsely. Claws curved, the tooth stout, long and median. Last joint of maxillary palpi elongate, cylindrical, not impressed. Length .80 —.90 inch; 20—23 mm.

MALE.—Antennal club nearly as long as the stem. Abdomen flattened and somewhat concave, penultimate ventral (fig. 38) slightly concave and granulate at middle and on each side an oblique obtuse ridge. Last ventral feebly concave, longitudinally impressed at middle, a slight emargination at apex. Inner spur broad and stout, moderately long, the outer long, broadest at middle.

FEMALE.—Club of antennæ shorter than the funiculus. Penultimate segment narrowly impressed parallel with the posterior margin. Last ventral with a rather broad and deep, abrupt emargination. Hind tarsi slightly shorter than in the male.

VARIATIONS.—A slight variation in color has been observed, but the sculpture seems very uniform. In the males the oblique carinæ on each side of the penultimate ventral, although generally separate, sometimes extend and meet in front of the depression.

This insect has exactly the form of *Knochii*, and has the thorax as little convex. By the table which precedes it is also allied to *rugosa*, which has a more convex thorax, the punctures less densely and rather irregularly placed.

Occurs in Texas. For specimens compared with the type we are indebted to Mr. A. Sallé, of Paris.

44. **L. rugosa** Mels.—Oblong, broader behind, moderately robust, rufocastaneous to piceous, shining. Clypeus acutely, moderately deeply emarginate, border narrowly reflexed, densely, moderately coarsely punctate, front rather more coarsely punctate. Thorax widest at middle, obtusely angulate, distinctly narrowed at base, more obliquely narrowed in front, margin crenate, sparsely ciliate, a slight depression of the base opposite the middle of each elytron, disc convex, the punctures coarse and deep, moderately closely, although somewhat irregularly placed, the median line and sometimes a space each side smoother. Elytral punctures finer than those of the thorax, very closely placed, somewhat rugulose each side of the suture, the sides and apex smoother, the discal costæ moderately distinct, the submarginal distinct in its posterior half. Pygidium with coarse sparsely placed punctures. Metasternum densely punctate, the hair moderately

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long and dense ♂, very short ♀. Abdomen sparsely, rather finely punctate at the sides, the last two segments more coarsely. Claws curved, the tooth strong and median. Last joint of maxillary palpus moderately elongate, slightly fusiform, not impressed. Length .70—.90 inch; 18—23 mm.

MALE.—Antennal club a little longer than the stem. Abdomen flattened at middle, penultimate segment deeply transversely depressed in its posterior half, on each side of which is a feeble obtuse, oblique elevation. Last segment concave, smooth, the apex broadly triangularly emarginate closed by membrane. Inner spur of hind tibia half the length of the outer, acute at tip.

FEMALE.—Antennal club small and lenticular, shorter than the funiculus. Penultimate ventral segment with a linear transverse impression near the posterior border, the last segment broadly emarginate. Posterior tarsi slightly shorter than the male.

VARIATIONS.—The usual variation in color from rufocastaneous to brown exists in this species, the latter color seeming to prevail in the western specimens (Nebraska). The angulation of the thorax varies in a marked degree, and some of the specimens approach *affinis* in such a decided manner that they might be placed together without reference to other characters; *corrosa* is also closely related in form and the sexual characters of the male alone separate them with certainty. The extent of the emargination of the last ventral segment ♀ varies in extent from a deep, squarely cut form to an arcuate emargination.

Occurs from Massachusetts to Colorado southward to North Carolina and Texas.

Group X, balia.

This group contains a small number of species which have the following characters in common: Inner spur of hind tibia ♂ fixed, and at least half as long as the outer spur. The antennæ are 9-jointed. Clypeus emarginate in all the species, although very feebly in *comans*, in which there is a mere sinuation. The last joint of the maxillary palpus is fusiform or subcylindrical, not impressed. The claws are strongly toothed in all except *comans*.

The antennæ have been shown to exhibit some variation in the number of joints in other parts of the series, and it might naturally be suspected that the species in the present group are composed of merely aberrant individuals of those series in which the antennæ are normally 10-jointed.

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With the large material now before me this matter has been carefully investigated, and there has not been found any very great resemblance in external form and sculpture between the species of this group and any other, except possibly in the case of *limula* and *cephalica*, and here as in all other cases the secondary sexual characters of the male are quite different. The species at present known may be approximately separated as follows:

Body with erect hairs rather sparsely placed; form moderately elongate and parallel.....45. **hirsuta.**

Body above entirely glabrous, with the exception of erect hairs on the head.

Clypeus with scarcely a trace of emargination; ventral sexual characters ♂ feeble.....46. **comans.**

Clypeus very distinctly emarginate.

Sutural stria deeply impressed, the sutural costa of normal width and convexity; antennal club ♂ as long as or longer than the stem.

Species more or less ovate; tarsal claws unequally toothed in the sexes.

Last ventral ♂ convex, the penultimate concave with a tuberosity each side.....47. **implicita.**

Last ventral ♂ concave, the penultimate segment with a transverse, obtuse ridge.....48. **balia.**

Species elongate, parallel; tarsal claws with a long tooth in both sexes. 49. **villifrons.**

Sutural stria feebly or not impressed, sutural costa narrow, scarcely elevated.

Surface with normal lustre; upper outline viewed laterally convex; pygidium ♀ not gibbous at apex.....50. **limula.**

Surface polished as if varnished; upper outline of elytra flat; pygidium gibbous at apex.....51. **nitida.**

45. **hirsuta** Knoch.—Oblong, nearly parallel, ferruginous brown to piceous, feebly shining, sparsely clothed with yellowish erect hairs, longer on the thorax. Head densely and coarsely punctured with moderately long hair, clypeus emarginate, the border moderately reflexed. Thorax widest at middle, slightly narrowed at base, more at apex, the margin entire, ciliate, basal margin channeled externally, surface with coarse punctures moderately closely placed, with long erect hairs. Elytral punctures much finer than those of the thorax, less impressed, denser and somewhat rugulose, the hairs sparser and shorter than on the thorax, the discal costæ not distinct. Pygidium moderately and not closely punctate ♂, coarsely and closely ♀, sparsely hairy. Metasternum densely punctured, the hairs yellow moderately dense, much longer in the male. Abdomen sparsely punctate at the sides, the second segment more densely ♂, the last two segments more coarsely. Claws arcuate, a strong acute median tooth. Last joint of maxillary palpi slender fusiform, not impressed. Length .58—.72 inch; 15—18 mm.

MALE.—Antennal club a little longer than the stem. Abdomen slightly flattened at middle, the penultimate segment at middle with a transverse, arcuate, rugulose elevation, behind which is a concavity. Last ventral flat. Inner spur of hind tibia fixed, a little shorter and stouter than the outer.

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FEMALE.—Antennal club as long as the funiculus. Last ventral segment broadly emarginate. Hind femora stouter, the tarsus a little shorter than in the male.

VARIATIONS.—Beyond the usual differences in color and size there is no variation. Some of the small specimens often have a resemblance, at first glance, to some of the darker forms of *tristis*.

Occurs from Michigan to North Carolina.

46. **L. comans** Burm.—Oblong, slightly broader behind, rufotestaceous to piceous, shining. Clypeus feebly sinuate at middle, the border not widely reflexed, moderately closely punctate, front convex, less closely punctate. Thorax narrowed in front, the sides regularly arcuate from the base, the margin somewhat irregular, but not crenate, punctures coarse, sparse, rather irregularly placed, a median smoother space, a distinct basal channel from the hind angles. Elytral punctures finer than those of the thorax and more closely placed, somewhat rugulose in the post-scutellar region in the male, the costæ faintly distinct. Pygidium coarsely indistinctly punctate at base, smoother at apex ♂, more elongate, smoother and gibbous at apex ♀. Metasternum densely finely punctured with long and abundant yellow hair in ♂, the hair shorter and sparser ♀. Abdomen sparsely punctulate at the sides, the punctures with short hairs. Claws arcuate, the tooth small and median ♂, larger in ♀. Last joint of maxillary palpus cylindrical not impressed. Length .58—.63 inch; 15—16 mm.

MALE.—Antennal club slightly longer than the stem. Abdomen flattened at middle, penultimate segment with slight oblique impressions each side. Inner spur of hind tibia short, slightly curved.

FEMALE.—Antennal club shorter than the funiculus. Metasternum less hairy. Last ventral segment broadly emarginate at apex.

VARIATIONS.—The two ♂ specimens before me are rufotestaceous, the female piceous and more shining, the metasternum brownish, the legs reddish.

There is no other species known to me in which one of the hind tibial spurs of the male is fixed and the ventral sexual characters are almost absent.

An opportunity occurred to examine the specimens from the cabinet of Dr. Zimmerman, and one was found bearing the number (141) under which it was sent to Burmeister. I have, therefore, been able to describe from what is practically a duplicate type. On comparison *rufiola* Lec., is found to be absolutely identical, while *sororia* is found to be a composite species the male being *comans*, the female a *micans* with the pruinosity lost. The type of *decidua* (unique) is also the same species, but there are associated with it specimens of another species also a member of the present group.

Occurs in Georgia, South Carolina and Florida.

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47. **L. implicita** n. sp.—Oblong-oval. convex, rufotestaceous to brown head and thorax always darker, moderately shining. Clypeus moderately deeply, acutely emarginate, the border moderately reflexed, surface closely rather coarsely punctate, front more densely punctate. Thorax narrowed from base to apex, more obliquely in front, the margin somewhat irregular, scarcely crenate. with short ciliæ, the punctures coarse, regularly, but not closely placed, the median line usually smoother, a distinct channel along the base externally. Punctures of elytra as coarse as those of the thorax, more shallow, closer, stellate and somewhat rugose, discal costæ very feeble, the submarginal usually more distinct. Pygidium sparsely indistinctly punctate. Metasternum densely punctate, the hair long and abundant ♂. shorter and sparser ♀. Abdomen indistinctly punctate at the sides, the last two segments more coarsely punctate. Claws arcuate, a small acute median tooth ♂, larger in ♀. Last joint of maxillary palpus fusiform, not impressed. Length .55—.68 inch; 14—17.5 mm.

MALE.—Antennal club longer than the stem. Abdomen flattened and slightly concave at middle. Penultimate segment (fig. 25) with a semicircular depression on each side of which is a short, oblique tuberosity. Last segment convex, sometimes with a slight median channel. Inner spur of hind tibia half the length of the outer, stout and slightly curved.

FEMALE.—Antennal club a little shorter than the funiculus. Pygidium more elongate than the male, slightly gibbous near the apex. Metasternum less hairy, the hind tarsi slightly shorter.

VARIATIONS.—The full color of this species is: elytra brown, head and thorax more nearly piceous, body beneath paler than above. Specimens occur with the elytra red-brown, in which case the sides of the thorax are paler. Another specimen is as rufotestaceous as *glaberrima*.

This species resembles *balia*, but the clypeus is more acutely and deeply emarginate, the surest method of separating these closely allied species is by reference to the male characters. It is likely that specimens of this species are mixed in most cabinets with *balia* and *comans*, and I think they partly constitute the series standing as *decidua* in the LeConte cabinet.

Occurs in Canada, Iowa, Missouri, Nebraska and Louisiana.

48. **L. balia** Say.—Oblong, distinctly broader behind, brown, head and thorax slightly darker than the elytra, surface moderately shining. Head coarsely and moderately densely punctured, front convex, with erect hairs. Clypeus broadly not deeply emarginate, margin narrowly reflexed. Thorax narrowed in front, widest at middle, very slightly narrowed posteriorly, more obliquely narrowed in front, the margin entire ciliate, punctures coarse not closely, somewhat irregularly placed, usually a smooth median space, a distinct basal channel externally. Elytra a little more finely punctured than the thorax and quite densely with a somewhat scabrous appearance, the discal costæ very indistinct. Py-

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gidium coarsely sparsely punctured, smoother near the apex. Metasternum densely punctate, the hair moderately long and dense; sides of abdomen sparsely punctate, the last two segments more coarsely. Claws curved, the tooth strong and median. Last joint of maxillary palpi slightly fusiform, not impressed. Length .60—.64 inch; 15—16 mm.

MALE.—Club of antenna as long as the stem. Abdomen broadly flattened at middle, the penultimate segment with an arcuate, transverse elevation in front of a slight concavity. Last segment with a cupuliform depression, the anterior margin somewhat elevated. Inner spur of hind tibia two-thirds as long as the outer and not thicker.

FEMALE.—Antennal club shorter than the funiculus. Metasternum less hairy than in the male, the hind tarsi distinctly shorter.

VARIATIONS.—As in all species with the thoracic punctures rather sparse, their distribution is somewhat irregular, although not so obviously as in *villifrons*.

This species is more decidedly oval in outline than either *villifrons* or *hirsuta*. It is the only species of the present group in which the last ventral ♂ has a well defined concavity, the ridge on the penultimate segment is very like *hirsuta*.

Occurs in the Middle States region westward to Illinois, a specimen given me marked Arizona is looked upon with doubt as to locality.

49. **L. villifrons** Lec.—Oblong, moderately elongate, slightly broader behind, rufotestaceous or castaneous, shining. Head coarsely and closely, almost cribrately punctured. Clypeus deeply emarginate, the border narrowly reflexed, frontal suture deeply impressed, front with short erect hairs. Thorax narrowed in front, the sides regularly arcuate, the margin not crenate, with short ciliæ, a distinct sulcus along the basal margin externally, disc shining, the punctures coarse and deep, sparsely placed, in many specimens there are large smooth spaces. Elytral punctures coarse and very closely placed, the discal costæ very indistinct. Pygidium with coarse, sparsely placed, indistinct punctures. Metasternum densely punctured, the hair moderately long, but not dense. Abdomen very sparsely punctate at the sides, the last two segments more coarsely. Claws curved, a strong acute tooth at middle. Last joint of maxillary palpus cylindrical, not impressed. Length .56—.62 inch; 14.5—16 mm.

MALE.—Antennal club (fig. 5) as long as the stem. Abdomen broadly flattened at middle, penultimate segment with a feeble arcuate elevation. Last segment broadly concave with a longitudinal impression at middle. Inner spur of hind tibia two-thirds the length of the outer, acute, moderately stout. Pygidium broad, the punctures large, but shallow.

FEMALE.—Antennal club shorter than the funiculus. Metasternum with shorter hair. Pygidium more oval and shining, the punctures smaller, but sharply impressed.

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VARIATIONS.—While in the greater number of specimens the thoracic punctures are equally scattered, many occur with smooth impunctured spaces, usually one on each side in front of the middle. The hairs on the front are often lost by abrasion, in such specimens the specific name may cause doubt.

With this species I unite *hirticeps* Lec., described like *villifrons* from a single specimen. The measurement given for the former .92 inch is evidently a typographical error for .62 inch.

Occurs in Canada, Pennsylvania, Illinois and Iowa. For *hirticeps* LeConte says Georgia, but this is doubtful.

50. **L. limula** n. sp.—Oblong, scarcely broader behind, convex, robust, rufo-testaceous, shining. Clypeus emarginate, the border narrowly reflexed, surface rather coarsely densely punctured, front convex, more coarsely punctured, a slight impression at middle of front. Thorax short, broad, rather more deflexed than usual, sides arcuately narrowed from base to apex, margin somewhat irregular, but not crenate, sparsely ciliate, a distinct basal channel, disc moderately coarsely punctate, the punctures not close, but somewhat irregularly scattered. Elytra more finely and closely punctured than the thorax, the surface smoother near the apex, sutural costa narrow, feebly elevated, the first discal moderately distinct, the others scarcely evident, the submarginal faintly distinct near the apex. Pygidium sparsely punctate, smoother near the apex. Metasternum densely punctured, the hair long and dense ♂, shorter and less dense ♀. Abdomen at sides sparsely punctate, the last two segments more coarsely. Claws arcuate, a strong median tooth in both sexes. Last joint of maxillary palpi slightly fusiform, not impressed. Length .55—.72 inch; 14—18 mm.

MALE.—Antennal club very little longer than the funiculus. Abdomen flattened at middle, the penultimate segment with an obtuse, transverse ridge divided by a depression at middle. Last ventral concave, the anterior margin elevated. Inner spur of hind tibia broad and stout, obliquely truncate at apex.

FEMALE.—Antennal club shorter than the funiculus. Spurs of hind tibiæ more slender. Pygidium more elongate and smoother. Posterior tarsi shorter than in the male.

VARIATIONS.—While the greater number of specimens have the costæ as described, others have them more evident. The color varies but little. The thoracic punctuation varies in distinctness, but not greatly.

This species greatly resembles *cephalica*, and like that species is more convex in outline when viewed laterally.

Occurs southward of Hudson's Bay, Montana, Colorado, Utah and Illinois.

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51. **L. nitida** Lec.—Oblong, nearly parallel, convex, dark brown, very shining as if varnished. Clypeus moderately deeply emarginate, the margin reflexed, surface densely and coarsely punctured, front convex, more coarsely but less densely punctured. Thorax short and broad, the sides arcuate from base to apex, the margin a little irregular but not crenate, sparsely ciliate, disc rather finely and distinctly punctured, a distinct fovea at the middle of the declivity each side, the basal channel distinct. Scutellum almost entirely smooth. Elytra with fine punctures more closely placed than on the thorax, sutural costa indistinct, the stria usually defining it scarcely visible, discal costæ very faintly indicated. Pygidium ♀ highly polished, sparsely punctate, conical, gibbous near the apex. Metasternum moderately closely punctate, the hair moderately abundant and long. Abdomen very shining, sparsely punctate, the last two segments more coarsely. Claws arcuate, the tooth long, strong and median. Last joint of maxillary palpus fusiform, not impressed. Length .80—.82 inch; 20.5—21 mm.

Of this species I have seen but two specimens, both females; the one in the cabinet of Dr. LeConte, the second given me by Dr. Hamilton. These two specimens agree in every detail, excepting as to the antennæ. In the typical specimen the antennæ are 9-jointed, while in mine the fourth and fifth joints are so closely united that the antennæ seem 8-jointed. The club is slightly shorter than the funiculus. The posterior tarsi are not quite as long as the tibiæ, and it is probable that the male will have longer tarsi.

Occurs in Georgia (LeConte) and at Allegheny City, Pennsylvania (Hamilton).

Group XI, ilicis.

This group is formed of rather heterogeneous material in aspect, yet related by certain characters, having affinities in two directions, *hirticula* and *delata* approximate *hirsuta* and its allies, while *ilicis* and *ciliata* resemble *brevidens* and *æmula* of the next series.

The clypeus is emarginate with narrowly reflexed border; antennæ 10-jointed, the ♂ club not long; inner spur of posterior tibia ♂ fixed, moderately long; claws armed with a strong median tooth; last joint of maxillary palpus slightly fusiform, not impressed; surface hairy.

The following are the species known:

Basal margin of the thorax channeled from the hind angles nearly to middle; sides of thorax not subangulate.
- Elytra with vittate series of erect hairs.....52. **hirticula.**
- Elytra with fine scattered hairs.....53. **delata.**

Basal margin of thorax not channeled, the median line usually finely carinate; sides subangulate.
- Surface of elytra distinctly pruinose, the pubescence uniform and recumbent.....54. **ilicis.**
- Surface not pruinose, elytra with vittate series of short erect hairs in addition to the recumbent.....55. **ciliata.**

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52. **L. hirticula** Knoch.—Oblong, slightly broader behind, fuscoferruginous to dark brown, moderately shining, head and thorax with erect hair, elytra with lines of erect hair along the usual costæ. Clypeus moderately deeply emarginate, the margin narrowly reflexed, surface very densely punctured, front more coarsely punctured and with erect hairs. Thorax narrower at apex, the sides more oblique in front, the margin usually entire, sometimes more or less crenate, with short ciliæ, surface variolately punctured, sometimes very densely, so that the surface is opaque, at others with distinct intervals, the thorax more shining, the erect hairs not long, but more abundant in the former race, a distint channel along the basal margin from the hind angles to near the middle. Elytra with much finer punctures, feebly impressed, rather closely placed, so that the elytra at times are rather scabrous than punctate, in every case they form a denser group at the middle third of the elytra external to the sutural costæ; erect hairs arranged in vittæ along the lines of the costæ forming thus five series, the margin fimbriate with longer hairs. Pygidium more convex and transverse in the male, coarsely sparsely punctured and shining, not hairy. Metasternum densely punctured, the hair moderately long. Abdomen moderately closely punctured along the sides, smoother at middle, each puncture with a very short hair. Claws curved, with a strong median tooth, alike in the sexes. Last joint of maxillary palpi subcylindrical, not impressed. Length .65—.75 inch; 16.5—19 mm.

MALE.—Antennal club a little longer than the funiculus. Abdomen flattened at middle, the penultimate segment at middle more depressed at its posterior half, on each side plicate. Last ventral slightly concave at middle. Inner spur of posterior tibia moderately long and acute.

FEMALE.—Antennal club shorter than the funiculus. Last ventral segment often vaguely impressed near the apex. Posterior tarsi distinctly shorter than in the male.

VARIATIONS.—The extreme forms of this species differ so greatly that they might, without intermediate forms, be considered distinct species. They may be divided as follows:

Southern forms (North Carolina to Texas). These are larger, the erect hairs of the surface longer and more abundant. Thorax very densely cribrately punctured and subopaque. Punctuation of metasternum very dense.

Central forms (Illinois, etc.). These are smaller in size, slightly more oval, the erect hairs less numerous, shorter and easily abraded. Thorax rather shining, the punctures variolate and separated by smooth, but narrow interspaces. Metasternum less densely punctured.

Eastern forms (Virginia northward and New England States). These are exactly intermediate between two forms above described. The thoracic punctures are large, variolate and closely placed, but

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not so densely, that the intervals between them are entirely obliterated. These are the typical forms as described by Knoch.

One peculiarity of the elytral sculpture is best marked in the southern forms, the denser group of punctuation on each side of the suture beginning about one-fourth from the scutellum, extending from that point nearly half way to the apex.

When the pubescence is entirely removed from a specimen, as may occur, it is difficult to distinguish an Illinois specimen from the group of species allied to *cognata*.

Occurs abundantly in the entire Atlantic region extending to Nebraska and Texas.

53. **L. delata** n. sp.—Oblong, slightly broader behind, piceous brown, head and thorax more shining, surface sparsely clothed with short, semi-erect, grayish hair. Clypeus moderately deeply, broadly emarginate, border very narrowly reflexed, surface densely coarsely punctate, front less densely, front and clypeus with short erect hair. Thorax narrowed from the base, the sides more oblique in front, margin subcrenate and ciliate, surface with coarse deep punctures not closely placed, a little closer near the side, each puncture with a short semi-erect hair, a distinct channel along the basal margin from the hind angles nearly to middle. Elytra rather finely and rather closely punctate, forming a somewhat denser space behind the scutellum, the punctures near the base slightly rugose, nearer the apex stellate, discal costæ very indistinct, the surface subopaque, sparsely clothed with short, fine, semi-erect pubescence. Pygidium sparsely, irregularly punctate. Metasternum densely punctured, the hairs yellowish, not long nor dense. Abdomen sparsely finely punctate at the sides, each puncture with a short hair, last two segments more coarsely punctured. Claws curved, with a strong median tooth. Last joint of maxillary palpi fusiform, not impressed. Length .65 inch; 16.5 mm.

MALE.—Antennal club a little longer than the funiculus. Abdomen slightly flattened at middle, penultimate segment (fig. 33) with an impression at middle which becomes rapidly wider and extends along the posterior border of the segment, on each side of the impression the segment is more convex, and with an oblique plica more external, last segment slightly concave, acutely notched at apex, a distinct longitudinal impression. Inner spur of hind tibia half the length of the outer, the latter long and slender.

Of this species I have seen but two males, not differing.

This species resembles *hirsuta*, but is more oval, less hairy, the clypeus more widely emarginate and more densely punctured. It has also 10-jointed antennæ, while in *hirsuta* they are but nine.

Occurs in eastern Kentucky.

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54. **L. ilicis** Knoch.—Oblong, slightly broader behind, brown, more or less opaque, elytra pruinose, surface sparsely clothed with short, recumbent hair, equal in length. Head piceous, with very short erect hair. Clypeus rather deeply emarginate, the border not widely reflexed, surface with the front, very densely and coarsely punctured. Thorax widest at middle, slightly narrowed at base, more obliquely narrowed in front, the margin crenate and ciliate, surface very densely granulate punctate, usually with a slightly elevated, smooth, median line, the pubescence recumbent and not conspicuous. Elytra densely punctulate and finely rugulose, the punctures shallow and for the most part indistinct, the discal costæ indistinct, the submarginal moderately distinct, the pubescence fine gray and recumbent, the margin usually ciliate. Pygidium shining, coarsely sparsely punctate. Metasternum densely punctured, the hairs long, but not dense. Abdomen moderately coarsely punctured at the sides, but not densely, each puncture with a short hair, the last two segments more coarsely punctured. Claws curved, tooth strong and median. Last joint of maxillary palpi fusiform, obtuse, not impressed. Length .75—.92 inch: 19—23.5 mm.

MALE.—Antennal club slightly longer than the funiculus. Abdomen flattened at middle, the penultimate segment (fig. 35) broadly transversely impressed with an oblique tuberosity each side. Last segment irregularly concave, distinctly emarginate at apex. Pygidium regularly convex, broader than long, the punctures not deeply impressed. Inner spur of hind tibiæ half the length of the outer, stout, obliquely truncate.

FEMALE.—Antennal club much shorter than the funiculus. Metasternum with shorter and sparser pubescence. Pygidium longer than wide, more convex at apex, punctures more abundant and deeply impressed. Posterior tarsi slightly shorter.

VARIATIONS.—All the specimens have the elytra distinctly pruinose, but to a variable degree, the specimens from the northern regions less distinctly. These latter have the discal costæ more evident, although they are never well developed at any time. The color varies but little.

The legs have always a clearer red color than the under surface and more shining, the femora of the female are always stouter than the male.

With this species I have united *subtonsa* Lec., founded on a single specimen which has lost the ciliæ of the elytra rather through accident than for specific reasons.

After a study of a pretty large series I believe it probable that Burmeister described his *ilicis* from an immature specimen. Two in my cabinet fit his description very well, and here it may be observed that the less mature the specimens are the greater the tendency of

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the short hairs to become erect. The *fimbriata* of Burmeister is the fully mature *ilicis*.

Occurs from New York to Georgia and Illinois.

55. **L. ciliata** Lec.—Oblong, moderately robust, slightly broader behind, subopaque, surface sparsely clothed with semi-erect grayish hair with some slightly longer, more erect hairs in vittæ on the elytra, not pruinose. Head nearly black, densely and rather roughly punctate, with short erect hair, clypeus moderately deeply emarginate, the border narrowly reflexed. Thorax widest at middle, slightly narrowed behind, more obliquely narrowed in front, the margin ciliate, not distinctly crenate, surface densely granulate-punctate, the median line slightly elevated, the hairs short and erect. Elytra densely punctate, the postscutellar region subgranulate, the discal costæ faintly developed, the submarginal distinct, but feeble; surface not pruinose, the pubescence sparse, semi-erect; the slightly longer, more erect hairs placed along the lines of the usual costæ margin ciliate. Pygidium coarsely punctured, smoother near the apex and often along the middle posteriorly, the female more densely punctured. Metasternum densely punctured, the pubescence moderately dense, but not very long; sides of abdomen more coarsely but less densely punctured, the last two segments more coarsely. Claws arcuate, the tooth strong, acute and median. Last joint of maxillary palpi slightly fusiform, not impressed. Length .80—.85 inch; 20—21.5 mm.

MALE.—Antennal club slightly longer than the funiculus. Abdomen flattened at middle, the penultimate segment flattened and finely asperate at middle, on each side a slight oblique tuberosity, the last segment slightly concave, emarginate at apex. Inner spur of hind tibia broad and stout, obliquely truncate at tip, the outer more slender, nearly twice as long. Pygidium regularly convex, broader than long.

FEMALE.—Club of antennæ much shorter than the funicle. Pubescence of metasternum shorter and less abundant. Pygidium nearly as long as wide, more narrowed towards tip, the surface more coarsely and densely punctured, especially above, and more gibbous near the apex. Hind tarsi slightly shorter.

VARIATIONS.—Nothing noteworthy has been observed. At times in this species as well as in *ilicis*, the median line of the thorax is not elevated.

The lines of longer hair on the elytra are not well marked, and are best seen by looking obliquely from the front. In view of the fact that specimens of *crenulata* occur with and without these erect hairs, it might be considered questionable whether *ciliata* should be separated from *ilicis*. Although my series of both species is quite large, I do not feel justified in speaking positively either way, but leave the matter for future determination.

Occurs in Wisconsin, Illinois, Missouri and Georgia.

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Group XII, crenulata.

The species of this group are of moderately large size, the upper surface hairy in different degrees. The clypeus is always emarginate, although feebly in several species, the margin narrowly reflexed. Last joint of maxillary palpi fusiform or cylindrical impressed in but one species. Antennæ 10-jointed, the male club not so conspicuously longer than that of the female, as is usual in the genus; the lateral margin of the thorax may be either entire or crenate; pectus with long hairs in some species, nearly naked in others. Abdomen moderately closely punctured over the entire surface. Claws with a strong, acute, median tooth alike in both sexes in *crenulata, rubiginosa, æmula, arcta* and *albina;* small and intramedian in the male, but stronger and more nearly median in the female, *parvidens* and *vetula;* posterior tarsi shorter in the female in *parvidens* alone. Spurs of posterior tibiæ free in both sexes.

The vestiture of the surface presents two forms—that in which the pubescence is uniform and recumbent, and that in which there are longer erect hairs intermixed. In *parvidens,* however, the erect hairs are not very obvious, except on the thorax. The erect hairs where they occur have a tendency to form a serial arrangement along the suture and the lines of the discal costæ and are always more abundant and longer in the females than in the males. One species has conspicuously long erect hairs on the elytra (*vetula*).

One of the species (*crenulata*) has a wide distribution, the others seem restricted and rather local. They are as follows:

Pubescence of upper surface fine and recumbent, without any intermixed erect hairs.
- Form robust, front and clypeus coarsely punctured.....56. **æmula.**
- Form cylindrical, punctuation extremely fine and dense.....57. **arcta.**

Pubescence of upper surface intermixed or erect.
- Margin of thorax strongly crenate.....58. **crenulata.**
- Margin of thorax at most feebly serrate behind the middle.
  - Pubescence of surface white .....59. **albina.**
  - Pubescence yellowish or brownish.
    - Upper surface with very long erect hair; palpi distinctly impressed; club of antennæ ♂ and ♀ equal. .....60. **vetula.**
    - Erect hair moderate; last joint of palpi not impressed; antennal club ♂ long.
      - Thorax shining, punctures not dense.....61. **rubiginosa.**
      - Thorax somewhat opaque, punctures close, often dense. 62. **parvidens.**

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56. **L. æmula** n. sp.—Oblong oval, slightly broader behind, facies rather robust, brown, surface distinctly pruinose, clothed with fine, short, recumbent pubescence. Clypeus emarginate, the border narrowly reflexed, coarsely and closely punctured, front more densely punctured with short semi-erect hairs. Thorax very obtusely angulate, the margin subcrenate, surface equally punctured, the punctures coarse and dense, not rugose nor confluent, each puncture bearing a short hair, a few erect hairs along the apical margin, the sides ciliate with longer hair. Elytra with punctures much finer than on the thorax less impressed and much less closely placed, each bearing a short recumbent hair; sutural costa distinct, discal costæ scarcely evident, submarginal costa distinct in its entire length, but not prominent; lateral margin ciliate with shorter hairs than on the thorax. Pygidium as closely punctured as the thorax. Metasternum not densely punctured. Abdomen rather finely and sparsely punctured, with short hairs. Legs more shining, usually reddish-brown. Claws with a large acute tooth at middle, slightly smaller and near the base in the female. Last joint of maxillary palpi long, slightly fusiform. Length .82—.90 inch; 21—23 mm.

MALE.—Antennal club scarcely as long as the funiculus. Abdomen vaguely impressed at middle, the penultimate segment with a slight triangular impression with feeble granulations each side.

FEMALE.—Antennal club very short. Posterior legs much stouter than in ♂, the tibiæ more dilated at tip.

VARIATIONS.—The only variation observed is in color. The typical form has the color and aspect of fully mature *ilicis*. One specimen before me is a very dark brown, almost piceous, from it the pubescence has been in great part removed.

This species resembles *ilicis*, and at superficial examination would be taken for that, but there is no smooth median thoracic line so commonly seen in that species. The structural (group) characters will easily distinguish the two species.

It has also considerable resemblance to *parvidens*, but in that species the hair is somewhat coarser and in part erect.

The hair covering the surface is very fine, and in carelessly collected specimens may be abraded, but there will hardly be any difficulty in assigning the species a place in the table.

This is the only instance known to me in which the claws are toothed nearer the base in the female than in the male.

Occurs in northern Georgia (Morrison).

57. **L. arcta** n. sp.—Oblong, subcylindrical, brownish ferruginous, head piceous, thorax a little darker than the elytra, semiopaque, surface clothed with extremely fine, short pubescence. Clypeus feebly emarginate, margin narrowly reflexed, surface densely punctured, front more finely and more densely punctured. Thorax with sides arcuate, the margin entire, surface with very fine and

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moderately dense punctuation, slightly shining, clothed with very fine and short pubescence; scutellum closely punctured. Elytra scarcely wider than the thorax, the punctuation dense, fine and equally disposed, each puncture with a short hair; sutural costa distinct, the discal costæ obliterated, submarginal costa distinct in its apical half. Pygidium shining, not closely punctate. Metasternum finely not closely punctate, the hair not long. Abdomen more shining than the upper surface, the punctuation fine, not close, pubescence short and easily abraded, last ventral segment with coarse punctures ♀. Legs somewhat red, the tibiæ and tarsi usually darker. Tooth of claws long, acute and median. Last joint of maxillary palpi moderately long and cylindrical. Length .60—.65 inch; 15—16 mm.

MALE.—Unknown.

FEMALE.—Antennal club shorter than the funiculus. Spurs of hind tibiæ long and slender.

Of this species but two specimens have been examined, both females, differing only in size.

Of all the species of Lachnosterna this has the finest punctuation, and on the elytra so closely placed as to produce the opacity of the surface. In form it resembles *quercus*.

Occurs in Texas, region unknown.

58. **L. crenulata** Fröhl.—Oblong, very little wider posteriorly, brown, feebly shining, surface clothed with short yellowish recumbent hair, often with erect hairs intermixed. Clypeus emarginate, the border reflexed, surface coarsely and closely punctate with short erect hairs, front more densely punctured with longer hairs. Thorax with lateral margin coarsely serrate, the median smooth line interrupted, surface very coarsely and closely punctate, less densely at sides and base, with moderately long erect yellowish hairs. Elytra equally punctured, the punctures much finer than on the thorax, moderately closely placed, sutural costa feeble, discal costæ usually indistinct, submarginal costa well marked and entire, surface with short recumbent pubescence, often with erect hairs intermixed. Pygidium with coarse moderately dense punctures and short erect hair. Metasternum moderately closely punctured at the sides, smoother at middle, the hair rather long but sparse. Abdomen less densely but more coarsely punctured and with short sparse pubescence. Claws with a strong median tooth, alike in both sexes. Length .65—.80 inch; 17—20 mm.

MALE.—Antennal club as long as the funiculus. Penultimate ventral segment vaguely concave at middle.

FEMALE.—Club shorter than the funiculus. Posterior legs stouter than in the male.

VARIATIONS.—In by far the larger number of specimens examined the pubescence of the elytra is uniform in character, being short and recumbent. This is the form assumed by the specimens from Massachusetts to North Carolina, but as the species is found a hundred or more miles west the pubescence is coarser, and a tendency

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is shown in some of the hairs to become erect, until in the more mountainous regions of western North Carolina and eastern Kentucky the erect hairs are observed to form distinct series as in *hirticula*, with the hairs even longer and more conspicuous. In those forms with the recumbent pubescence only the elytral costæ are extremely feeble, as the erect hairs become more evident the costæ are better developed. The punctuation of the thorax is also much denser in those in which the pubescence is coarser. The last joint of the maxillary palpi is long and cylindrical.

As has already been noted in the generalties, those specimens in which the erect hairs of the elytra are the most conspicuous are females.

Occurs in the region bounded by Massachusetts and South Carolina, Kansas and Indian Territory.

59. **L. albina** Burm.—Oblong oval, distinctly broader behind, brown, moderately shining, surface rather densely clothed with white hairs. Clypeus emarginate, the border narrowly reflexed, densely punctured and with short erect hairs, front more coarsely punctured, the pubescence partly recumbent, the erect hairs longer than on the clypeus. Thorax obtusely angulate on the sides, the lateral margin entire, disc moderately coarsely and closely punctate, without median smooth line, the white pubescence moderately long and recumbent, with erect hairs intermixed. Elytra nearly as coarsely punctured as the thorax, but less densely; the usual costæ, including the submarginal well marked, the pubescence, as on the the thorax, but with few erect hairs intermixed near the base and sides, more numerous in the females. Metasternum densely punctured, the pubescence long and erect. Abdomen equally punctured over the entire surface, the punctures a little coarser, but not so dense as on the metasternum, the pubescence fine and recumbent. Pygidium densely punctured, the pubescence recumbent. Claws with a moderately large, acute, median tooth. Length .60—.70 inch; 15--18 mm.

MALE.—Antennal club a little longer than the funiculus; ventral segments slightly flattened at middle.

FEMALE.—Club distinctly shorter than the funiculus.

Of this species I have examined five specimens which show no special variation, except slightly in size.

The last ventral segment is extremely short, and might almost escape observation. It is an easily recognized species by the conspicuous white pubescence of the surface. The last joint of the maxillary palpi is fusiform.

The specimens seen have been collected in Indiana and Mississippi. It has, probably, a limited distribution.

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60. **L. vetula** n. sp.—Oblong oval, broader behind, color variable from ferruginous to dark brown, surface more or less pruinose, distinctly so in the darker specimens, sparsely clothed with very short recumbent hair, the elytra with very long erect hair near the base and along the suture. Clypeus very feebly emarginate, the margin reflexed, surface shining with coarse deep punctures not closely placed, frontal suture deeply impressed, front shining, coarsely and deeply punctured, somewhat rugose, with moderately long erect hairs. Thorax very obtusely angulate, the margin coarsely serrate, the punctures of the disc moderate in size, sparsely placed, a little coarser near the sides, each puncture having a moderately long erect hair, the lateral margin with long hair. Elytra with moderately coarse punctures, very regularly and moderately closely placed, each puncture with a short semi-erect hair, with very long erect hairs arising from special punctures on each side of the scutellum and along the sutural costa, also along the first discal costa ♀, lateral margin ciliate with shorter hairs. Pygidium convex, coarsely punctured with short erect hairs and longer hairs nearer the apex, more abundant in the female. Metasternum densely but indistinctly punctured, with moderately long erect yellow hair. Abdomen very sparsely punctate with short erect hairs. Last joint of maxillary palpi fusiform, obtuse, a moderately deep impression on the outer side. Length .50—.75 inch; 13—19 mm.

MALE.—Antennal club small, shorter than the funiculus. Spurs of hind tibiæ slender and long. Claws feebly curved, the tooth relatively small and within the middle. Abdomen vaguely impressed at middle. Last ventral segment transversely impressed, the anterior border of the segment with two very obtuse teeth (fig. 13) directed backward. Penultimate segment obtusely elevated at middle, obliquely flattened and subgranulate; erect hairs of elytra shorter and forming one series along the sutural costa.

FEMALE.—Antennal club as in the male. Claws more curved, the tooth larger and median. Spurs of hind tibiæ broader than in male; erect hairs of elytra much longer than in the male and forming an additional line in the usual position of the first discal costa.

VARIATIONS.—The color varies greatly from a pale ferruginous to a dark purple brown, as in *micans*. The elytral costæ are usually entirely obliterated, although some few show faint traces of them. As a rule the males are paler than the females. In some specimens the glaucous coating is so conspicuous on the thorax as to cause it to appear white in certain lights.

This species appears closely allied to a Mexican form which bears the mss. name *longipilosa* Reiche, of which I have seen only a female. In the latter the margin of the thorax is less crenate and the last joint of the maxillary palpi acutely ovate. Burmeister describes several closely allied, especially *setifera*, which is described as densely pubescent and the thoracic margin not crenate.

Occurs in Arizona (Morrison), New Mexico (Prof. Snow).

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61. **L. rubiginosa** Lec.—Oblong-oval, scarcely broader behind, ferruginous brown, thorax moderately shining, elytra pruinose, sparsely clothed with semi-erect hair, longer on the thorax and base of elytra. Clypeus emarginate, the border narrowly reflexed, coarsely and moderately closely punctured, front more coarsely, less closely punctured and with erect hair. Thorax with arcuate sides, the margin ciliate, subcrenate posteriorly, disc with moderate punctures, evenly placed over the surface and well separated, each bearing a moderately long erect hair. Elytral punctures finer than those of the thorax, evenly arranged, not closely placed, each with a semi-erect hair, with longer hairs at base and along the lines of the costæ in the female, less distinct in male, margin ciliate; discal costæ scarcely evident, the submarginal distinct at apical half. Pygidium coarsely not closely punctate, sparsely hairy. Metasternum moderately densely punctured, the hair long and yellowish. Abdomen more finely and sparsely punctate, subopaque, the hairs short and sparse, longer on the last two segments. Claws curved, the tooth strong, acute and median. Last joint of maxillary palpi fusiform, obtuse, not impressed. Length .60—.75 inch; 15—19 mm.

MALE.—Antennal club as long as the entire stem. Penultimate ventral segment slightly flattened at middle, the punctures muricate. Last ventral with slight, longitudinal, median impression; longer erect hairs of elytra not obvious, except near the base. Pygidium broader than long.

FEMALE.—Antennal club very short; erect hairs of upper surface more abundant than in the male, and forming distinct lines along the lines of the costæ. Tarsi, especially the posterior, shorter than in the male. Pygidium longer than wide.

VARIATIONS.—Size and slightly in color are the only variations observed.

By reference to the characters of the tables this species may be readily known. Although placed adjacent to *parvidens* there are many points of difference: the punctuation of thorax, the style of pubescence and the position of the tooth of the claws.

Occurs in Kansas and Texas, those from the former State are smaller and lighter in color.

62. **L. parvidens** Lec.—Oblong-oval, slightly broader behind, moderately robust, brown, sometimes more or less ferruginous, subopaque, very slightly pruinose, sparsely pubescent, with larger erect hairs on the head, thorax and base of elytra. Clypeus feebly emarginate, the border narrowly reflexed, coarsely, deeply and closely punctured, front more densely punctured and with short erect hairs. Thorax very obtusely angulate, the lateral margin irregular, but not truly crenate with long hairs, surface moderately coarsely and closely punctate, more densely and coarsely at the sides, surface with short, semi-recumbent hairs with longer erect hairs intermixed. Elytra equally punctate, the punctures coarse, close, but not dense; the sutural costa distinct, the first discal costa feebly indicated, the submarginal extremely feeble, surface sparsely clothed with short recumbent pubescence, with longer erect hair intermixed at base.

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Pygidium closely, subgranulate-punctate, with short recumbent hair. Metasternum densely punctured, with long yellow hair. Abdomen finely, indistinctly, not closely punctate, opaque, the pubescence very short and sparse. Last joint of maxillary palpi fusiform, not impressed. Length .75—.90 inch; 19—23 mm.

MALE.—Club of antennæ nearly as long as the entire stem. Spurs of hind tibiæ slender; claws feebly curved, the tooth small and intramedian. Penultimate ventral segment slightly flattened with granular elevations at middle. Pygidium distinctly broader than long.

FEMALE.—Club shorter than the funiculus. Claws more curved, the tooth stronger than in the male. Pygidium distinctly as long as wide. Posterior legs much stouter than in the male, the femora especially, the tibiæ much broader at apex. Tarsi on all the legs distinctly shorter than in the male.

VARIATIONS.—The only variation observed is that of color, due probably to the varying maturity of the specimens. The males have the thorax a little more closely punctate and consequently slightly less shining.

Occurs in Georgia, Florida (and Texas?).

Group XIII, submucida.

Form variable in the species, but never truly cylindrical, the surface iridescent in *submucida* alone, more or less shining in the others; clypeus emarginate or truncate. Last joint of maxillary palpi fusiform or cylindrical, at most feebly impressed; lateral margin of thorax entire, at most feebly ciliate; breast with moderate hair; spurs of hind tibiæ free in both sexes; tooth of claws never large, always intramedian, often close to the base.

The species all belong to the southwestern region, and are as follows:

Anterior tibiæ normally dentate, the upper tooth very small.
- Surface iridescent; species larger, of robust facies, the submarginal costa well developed ..... 63. **submucida.**
- Surface glabrous, not iridescent nor pruinose; species smaller and more distinctly ovate, the submarginal costa rarely visible.
  - Surface not shining ..... 64. **glabricula.**
  - Surface very shining ..... 65. **fucata.**

Anterior tibiæ with the upper tooth nearly as long, fully as acute as the middle tooth.
- Clypeus truncate; color piceous brown ..... 66. **exorata.**

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The character used to separate *glabricula* and *fucata* does not seem very strong, but in nature the difference is very striking, the ventral male characters are also different.

63. **L. submucida** Lec.—Oblong, subcylindrical, slightly broader behind, facies robust, reddish-brown or rufopiceous, surface distinctly sericeous or iridescent. Head moderately broad, eyes not prominent, color usually darker. Clypeus flat, emarginate, margin narrowly reflexed and with the front densely and rather coarsely punctured. Thorax narrowed in front, the sides arcuate, margin very feebly crenate by the insertion of distant ciliæ, surface equally punctate, with punctures of moderate size not closely placed. Punctures of elytra coarser and deeper than those of the thorax, not closely placed, the usual costæ distinctly indicated, the submarginal well developed and entire. Pygidium somewhat irregular, the punctures coarse, rather close, but shallow. Last joint of palpi fusiform, not impressed. Claws arcuate, with an acute tooth near the base, larger in the female. Length .75—.80 inch; 19—20.5 mm.

MALE.—Club of antennæ shorter than the stem. Abdomen slightly flattened at middle, the hind margin of the penultimate segment (fig. 24) abruptly thickened with acute granulations.

FEMALE.—Club of antennæ shorter than the funiculus. Posterior tarsi a little shorter than in the male.

VARIATIONS.—Numerous specimens have been seen, but no variation worthy of mention has been observed.

This species is one of the few in which the surface is sericeous or slightly iridescent. In this form of surface, immersion in alcohol does not seem to injure the lustre, while in those truly pruinose, like *micans* and *prunina*, the coat is often entirely removed.

In perfectly fresh specimens the punctures of the elytra bear an extremely short, recumbent hair as in *prununculina*, but in the great majority of specimens these are not seen.

Occurs quite commonly in western Texas, taken by Belfrage at Waco.

64. **L. glabricula** Lec.—Oblong, subcylindrical, slightly broader behind, rufotestaceous or slightly darker, surface moderately shining, not iridescent. Head moderately broad. Clypeus emarginate, rather concave, the margin reflexed, moderately coarsely not densely punctate, front more densely. Thorax distinctly narrowed in front, sides arcuate, margin entire, sparsely fimbriate, disc evenly punctate, the punctures coarser and moderately close. Elytra with punctures as coarse as those of the thorax, less densely placed, less deep near the apex, the surface somewhat wrinkled; sutural costa well marked, the discal and submarginal almost entirely obliterated. Pygidium more finely punctured than the thorax, the punctures rather irregularly placed. Metasternum closely punctate, the hairs moderate, not dense Abdomen shining, sparsely punctate, with short hairs at the side. Last joint of maxillary palpi fusiform, not impressed. Claws arcuate, the tooth moderate in size, near the basal dilatation. Length .55—.65 inch; 14—16.5 mm.

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MALE.—Antennal club a little longer than the funiculus. Abdomen flattened at middle, posterior half of the penultimate segment obliquely declivous, finely granulate. Last segment flat, slightly granlate.

VARIATIONS.—The larger number of specimens are nearly as cylindrical as *ephilida*, others are slightly oval. The elytral costæ vary somewhat in distinctness, but in no specimens is the submarginal fairly developed.

At the time of the original description Dr. LeConte suspected that this might possibly be a small race of *submucida*. This seems now very unlikely. The clypeus is more concave, the punctures of entire surface coarser; there is no iridescence, and finally the male characters are sufficiently different.

I have seen very many of this species at times, but in the two dozen or more now accessible I have not found a female.

Occurs in Kansas and Texas, probably extending into Mexico.

65. **L. fucata** n. sp.—Oblong, slightly ovate, reddish-brown or pale castaneous, surface very shining. Head not broad. Clypeus emarginate, slightly concave, the margin narrowly reflexed, coarsely and moderately closely punctate, front more closely. Thorax distinctly narrowed in front, sides arcuate, margin entire, not ciliate, punctures of disc moderate in size, regularly placed, but not close. Elytral punctures of similar size to those of the thorax, rather more closely placed, but sparser near the apex, sutural costa distinct, discal costæ very feeble, submarginal costa well marked posteriorly. Pygidium sparsely but regularly punctate, the punctures finer than on the thorax. Metasternum closely punctate, the hair moderately long, but not dense. Abdomen sparsely finely punctate, the penultimate segment more coarsely punctured at the sides. Last joint of maxillary palpi subcylindrical, slightly impressed. Claws arcuate, the tooth moderate in size, slightly intramedian. Length .55—.65 inch; 14—16.5 mm.

MALE.—Club of antennæ as long as the funiculus. Penultimate ventral segment (fig. 23) slightly flattened posteriorly and with a slight arcuate process projecting over the suture with the last ventral, the sides sometimes obliquely plicate.

VARIATIONS.—In some specimens the elytra are slightly wrinkled.

Of this species I have examined nine specimens, all males. It is remarkable in this part of the genus by its very shining surface.

Collected in southern Arizona (C. G. Pringle).

66. **L. exorata** n. sp.—Oblong, slightly oval, facies moderately robust, dark chestnut-brown, surface feebly shining. Head not broad. Clypeus subtruncate, margin moderately reflexed, punctuation coarse and closely placed, frontal suture rather deeply impressed, front more densely punctured, somewhat rugulose. Thorax with sides strongly arcuate in front, parallel behind, margin rather dis-

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tantly ciliate, basal margin depressed each side, punctuation coarse, rather close, regularly disposed. Elytral punctuation as coarse as on the thorax, more closely placed, somewhat rugulose, near the apex smoother, a slight depression of the base within the humeri, discal costæ, except the sutural, very indistinct. Metasternum densely punctured, the hair long, yellow and abundant. Abdomen sparsely indistinctly punctate. Pygidium subopaque, extremely finely alutaceous, not distinctly punctured. Last joint of maxillary palpi slender, fusiform, not impressed. Claws feebly curved, tooth small and close to the base. Anterior tibiæ with the upper tooth nearly as long and fully as acute as the middle tooth (fig. 6). Length .66—.70 inch: 17—18.5 mm.

MALE.—Antennal club as long as the entire stem. Abdominal characters wanting, except a very slight concavity of the last ventral segment.

VARIATIONS.—Six specimens have been examined showing no notable variation.

The punctures of the thorax and elytra each bear a very short hair, so short as to be entirely within the puncture and scarcely visible. This is not mentioned in the above description, as in species in which such hairs occur but few specimens retain them. The form of the thorax is described from a vertical view. On the declivity of the sides of the thorax in the two specimens now before me there is a slight depression.

One of the most striking characters of this species is the form of the anterior tibiæ. The teeth are all slender and long, the upper tooth being very nearly as long as the second tooth. The upper tooth in all other species is at best small, and often merely an angulation, the extreme in another direction is seen in the *maculicollis* group, in which the upper tooth is entirely gone.

Occurs in Texas. I am indebted for my specimens to Mr. Otto Lugger, of Baltimore.

Group XIV, ignava.

This group contains but one species of elongate cylindrical form, glabrous, shining. The head is broad, the eyes large, clypeus emarginate. Thorax very little narrower at apex than base, the sides coarsely serrate. Elytra not wider than the thorax. Antennæ 10-jointed; spurs of male hind tibiæ free and slender. Claws with a small acute tooth at middle. Last joint of maxillary palpus fusiform, slightly flattened externally.

By its form and broad head the species is more closely allied to the *quercus* group; from the *submucida* group it differs in its elongate form and serrate thoracic margin.

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67. **L. ignava** n. sp.—Oblong, cylindrical, chestnut-brown, shining. Head broad, eyes moderately prominent. Clypeus flat, feebly emarginate, the border very narrowly reflexed, surface densely and rather coarsely punctate, front similar. Thorax rather short, very little narrower at apex than at base, sides arcuate, margin coarsely crenate, surface with rather coarse, subvariolate punctures closely, but somewhat irregularly placed. Elytra parallel, not wider than the thorax, punctures as coarse as on the thorax and moderately closely placed, less deeply impressed near the apex, sutural costa rather feeble, the discal costæ indistinct, the submarginal feeble near the apex. Pygidium coarsely sparsely punctate. Metasternum closely punctate, the hair moderate in length, not dense. Abdomen sparsely rather finely punctate, without hair. Claws feebly curved, a moderate tooth at middle. Last joint of maxillary palpi moderate in length, slightly flattened externally. Length .60—.65 inch; 15—16.5 mm.

MALE.—Club of antenna a little shorter than the entire stem. Abdomen without characters.

FEMALE.—Club shorter than the funiculus. Posterior tarsi a very little shorter than in the male, the pygidium a little longer.

VARIATIONS.—About a dozen specimens have been seen in various collections without variation, except slightly in color.

This species and *boops* are more nearly truly cylindrical than any others in our fauna. It is also one of the few with absolutely no sexual differences in the abdomen.

Occurs in Texas and New Mexico (Prof. Snow).

The following species should probably be referred to this group if it really is a member of our fauna. The description is from Blanchard supplemented by notes taken by myself from the type:

68. **L. longicornis** Blanch.—Oblong, nearly parallel, subcylindrical, brown, shining, slightly paler beneath, glabrous. Clypeus feebly emarginate ("integer" Bl.) and with the front densely punctured. Thorax with feebly arcuate sides, the margin crenulate, surface densely punctured and with a pseudo-strigose appearance. Elytra moderately punctate, the costæ very indistinct. Pygidium finely punctate. Legs somewhat reddish. Metasternum with pale hairs. Claws with a small tooth slightly in front of the middle. Length 18—19 mm.

MALE.—Antennal club longer than the stem. Abdomen vaguely impressed at middle, the last two segments without sexual characters.

The locality is indefinitely given as "Amér. Bor." Du voyage de M. de Castelnau.

Two reasons have caused me to doubt that this species belongs to our fauna. First, nearly all the species given by Castelnau described in Blanchard's catalogue are from Brazil; secondly, the tooth of the claw is small and *in front of the middle*, a character entirely unknown in our large series of species.

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Group XV, quercus.

This group contains a few species in which the form is decidedly cylindrical and the antennæ 9-jointed; the clypeus is entire in three species and emarginate in two, the margin in all rather widely reflexed; the last joint of the maxillary palpi is fusiform, and at most with a slight flattening on the outer side; the breast is feebly hairy in all except *ecostata*, which is further remarkable in having the hind angles of the thorax rounded and the elytra without costæ; the anterior tibiæ are tridentate in the usual manner; the spurs of the male hind tibiæ are free and slender; the claws have in three species a small basal tooth, but in *quercus* the tooth is large and median; two species are more or less iridescent, the others glabrous. The head is rather broad, with prominent eyes in three species, small in *ecostata*.

The species adopted as the typical form of the group was made the type of Endrosa by Dr. LeConte. I have given, in sufficient detail elsewhere, the reasons for rejecting the genus, and find, since the discovery of allied species, that it must take its place in this portion of the older genus Lachnosterna.

The following species are at present known:

Hind angles of thorax distinct; sutural costa of elytra always present.
  Clypeus more or less emarginate.
    Surface subopaque or iridescent; tooth of claws large and median. 69. **quercus.**
    Surface shining.
      Tooth of claws large and median; inner spur of hind tibiæ long and slender.....70. **inepta.**
      Tooth of claws small and basal; inner spur of hind tibiæ short. 71. **affabilis.**
  Clypeus entire; surface glabrous; tooth of claws small and nearly median.
      Head not broad, thorax distinctly narrowed in front; color rufotestaceous .....72. **clypeata.**
      Head broad, eyes large, thorax scarcely narrower at apex than at base; color dark brown or piceous. .....73. **boops.**
Hind angles of thorax rounded; elytra without trace of costæ; pectus with long hair.
  Clypeus entire; surface subopaque; tooth of claws small and basal. 74. **ecostata.**

Both sexes are known of *quercus*, *clypeata* and *boops*, males only are known of the others.

69. **L. quercus** Knoch.—Oblong, cylindrical, rufotestaceous, head darker, elytra paler, surface glabrous, pruinose. Clypeus emarginate, margin narrowly reflexed, punctures moderate, not closely placed, front more coarsely punctured. Head broad, eyes large. Thorax rather short, very little narrowed in front, sides arcuate, not crenate, distantly ciliate, punctures moderate in size, very regularly

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scattered, but sparse. Elytra as coarsely punctured as the thorax, but a little more closely, becoming somewhat finer near the apex, discal costæ faintly indicated, margin distantly fimbriate. Pygidium more shining, coarsely sparsely punctate. Metasternum moderately finely not densely punctate, the hair not long. Abdomen very sparsely punctate, each puncture with a short hair. Last joint of maxillary palpi slender, moderately long, not impressed. Claws arcuate, with a strong median tooth in both sexes. Length .58—.64 inch; 14.5—16 mm.

MALE.—Antennal club as long as the stem. Penultimate ventral segment slightly impressed at middle and slightly granulate. Pygidium wider than long.

FEMALE.—Club much shorter than the funiculus. Pygidium as long as wide. Last ventral segment more shining and more coarsely punctured.

VARIATIONS.—None have been observed, except slightly in color.

This species is the type of the genus Endrosa *Lec.*, based on the emarginate ligula. This occurs so frequently among those recognized as Lachnosterna in LeConte's "Revision" as to have no value for generic separation.

The broad head and large eyes of this and the associated species recall a similar form in *prununculina* and its allies.

Occurs from the Middle States southward to Georgia.

70. **L. inepta** n. sp.—Oblong, subcylindrical, rufotestaceous, shining. Clypeus emarginate, the border narrowly reflexed, moderately coarsely not densely punctured, front similarly punctured. Thorax rather short, narrowed in front, sides arcuate, margin entire, with short ciliæ, the punctures rather coarse, not closely but regularly placed, a distinct smooth median space, a slight depression at the middle of the declivity. Elytral punctures a little coarser than on the thorax and somewhat more closely placed, the costæ all moderately distinct. Pygidium moderately closely punctate, but smoother near the apex. Metasternum moderately densely punctured, the hair not long and rather sparse. Abdomen sparsely punctate at the sides. Last joint of maxillary palpi slightly fusiform, not impressed. Claws curved, the tooth large and median in the male. Length .60 inch; 15 mm.

MALE.—Antennal club very little longer than the funiculus. Abdomen slightly flattened at middle, penultimate segment with a distinctly limited oval concavity, on each side of which is an obtuse pyramidal tuberosity. Last ventral not impressed. Spurs of hind tibiæ long and slender. Pygidium broader than long.

This species resembles both *affabilis* and *ephilida* in form and color, being, however, more closely related to the former, but differing more especially in those characters to which attention has been called in the table. The female is unknown.

Two male specimens, Ohio.

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71. **L. affabilis** n. sp.—Oblong, subcylindrical, rufotestaceous, surface shining. Head moderately broad, darker in color. Clypeus feebly but distinctly emarginate, margin moderately reflexed, punctures moderately coarse not close, front more finely and closely punctate. Thorax short, sides regularly arcuate, margin entire, not ciliate, punctuation moderately coarse, regularly placed, not close, smoother near the sides. Elytra with punctures as coarse and close as on the thorax, the surface somewhat scabrous also, the costæ faintly indicated. Pygidium coarsely sparsely punctate. Metasternum sparsely coarsely punctate, the hair short and sparse. Abdomen sparsely punctate at the sides, smoother at middle, not hairy. Last joint of palpi fusiform, slightly impressed. Claws feebly curved, the tooth small and very near the base in the male. Length .61 inch; 15 mm.

MALE.—Antennal club nearly as long as the stem. Abdomen broadly flattened at middle, the last segment with a slight concavity.

Of this species I have seen but two male specimens exactly alike. It has a great resemblance in form and color to *ephilida*, but differs widely in more important characters.

The inner spur of the hind tibia, although free, is nearly as short as in some species of the *cerasina* group, and without careful examination might be supposed to be connate with the tibia. The last ventral segment is, however, short, as is usual with these species with both hind tibial spurs free in the male.

Occurs in Kansas.

72. **L. clypeata** (*integra* ‖ Lec.)—Oblong, slightly broader behind, rufotestaceous, moderately shining. Head coarsely moderately closely punctate, clypeus entire, concave, the border rather widely reflexed. Thorax arcuately narrowed from base to apex, the margin entire with short ciliæ, surface moderately coarsely and closely punctate. Elytra as coarsely punctate and rather more closely, the discal costæ plainly indicated, but not prominent, humeral umbone rather more prominent than usual. Pygidium sparsely punctate, smooth at apex, the punctures in female more distinct. Metasternum closely punctate, the hair rather sparse and not long. Abdomen very sparsely indistinctly punctate at the sides, the last two segments more coarsely. Claws feebly curved, the tooth small and intramedian. Last joint of maxillary palpi fusiform, distinctly impressed. Length .65—.70 inch; 16.5—18 mm.

MALE.—Antennal club longer than the funiculus. Abdomen impressed at middle, the last segment flat, the anterior border slightly thickened, the surface posteriorly with small granular elevations. Spurs of hind tibiæ unequal, the outer longer and more slender.

FEMALE.—Antennal club shorter than the funiculus. Pygidium slightly longer and more distinctly punctate.

Superficially this species resembles *affabilis*, but the clypeus is entire, and the male ventral characters different.

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This species was described by Dr. LeConte from one male as *integra*, and placed in the series in which the inner spur of the hind tibiæ male is fixed. This is doubtless due to error of observation, the type being rather old and inferior. The coincident presence of one fixed spur and the tooth of claws small and intramedian is unknown to me. This fact would not have escaped Dr. LeConte had he more material, and the species would not have been placed in proximity to the *hirsuta* group.

Occurs in Georgia and Florida.

73. **L. boops** n. sp.—Oblong, cylindrical, castaneous to piceous, shining. Head broad, eyes large and prominent. Clypeus entire, the margin moderately reflexed, moderately coarsely sparsely punctate, front similarly punctate. Thorax short, scarcely narrowed in front, sides arcuate, distantly ciliate, margin entire, punctuation coarse, rather sparse, evenly disposed on the disc, sparser at sides. Elytra more coarsely and rather more closely punctured than the thorax, the sutural and first discal costæ distinct, the others obliterated. Pygidium more finely punctured and rather more closely. Metasternum moderately coarsely, not closely punctate, the pubescence scarcely evident. Abdomen sparsely indistinctly punctate, smooth at middle. Last joint of maxillary palpi slightly fusiform, feebly impressed. Claws feebly curved, a small tooth, median ♀, slightly intramedian ♂. Length .45—.50 inch; 11.5—13 mm.

Male.—Antennal club one-half longer than the stem. Abdomen slightly flattened. Last segment (fig. 20) foveate, emarginate and with two dentiform processes projecting backward from near the anterior margin of the segment. Pygidium broader than long.

Female.—Antennal club shorter than the funiculus. Last ventral segment nearly as long as the penultimate. Pygidium as long as wide.

Variations.—No variation has been observed, except in color, probably from varying maturity.

This species, by its form and structural peculiarities, associates very naturally with *quercus*. It is remarkable in having the last ventral segment of the female larger than is usual in the species in which both hind tibial spurs ♂ are free. The hind tarsi are distinctly shorter in the female than in the male.

Collected in northern Georgia (Morrison).

74. **L. ecostata** n. sp.—Oblong, subcylindrical, slightly depressed, subopaque (probably slightly sericeous when recent), rufotestaceous, thorax slightly darker, head brownish. Antennæ rufous, club piceous brown. Head not broad. Clypeus entire, concave, the margin rather widely reflexed, coarsely and closely punctate; frontal suture straight, front cribrately punctured. Thorax narrowed in front, sides regularly arcuate, margin entire sparsely ciliate, hind angles

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rounded, disc coarsely sparsely punctate, punctures indistinct near the hind angles, a few scattered hairs near the sides. Elytral punctures coarse and sparsely placed, the surface without trace of costæ, the sutural costa being entirely obliterated, margin with short ciliæ. Metasternum moderately deusely punctured, the hairs rather dense, long and yellowish-white. Abdomen sparsely punctate, with short hairs. Claws ♂ feebly arcuate, the tooth small and close to the base. Last joint of maxillary palpi fusiform, obtuse, not impressed. Length .62 inch; 16 mm.

MALE.—Club of antenna one-third longer than the stem. Abdomen absolutely simple.

Of this species I have seen but one specimen remarkable in having the hind angles of the thorax rounded and the sutural costa of the elytra entirely obliterated. When recent the surface is probably slightly pruinose or sericeous, but the specimen has been collected in alcohol, and this often removes the pruinosity and makes the sericeous appearance dull and subopaque.

Occurs in southwestern Texas.

Group XVI, tristis.

This group contains three species of oblong or slightly oval form with the following peculiarities: The head is small, clypeus entire (fig. 2) and rather deeply concave, coarctate at base, not extending to form a part of the canthus of the eye; upper surface of body hairy, the hairs erect on the head and thorax and at the base of the elytra; thorax feebly crenate in *lenis* only; elytra with feeble discal costæ; pectus with moderately long hair; antennæ 10-jointed, the joints often very indistinct; anterior tibiæ normally toothed; spurs of posterior tibiæ free in both sexes; the tarsal claws have a rather small tooth; always intramedian in the male, longer in the female; the posterior tarsi of the female of *crinita* are notably shorter than the male.

The following table will aid in the identification of the species:

Elytra with little or no pubescence, surface glabrous; antennal club ♂ much longer than the entire stem..... ....75. **crinita.**
Elytra hairy; antennal club not longer than the stem.
Above abundantly hairy, the surface shining.. .....76. **tristis.**
Above sparsely finely hairy on the elytra, the surface distinctly pruinose. 77. **lenis.**

Of these species *tristis* is widely distributed, *lenis* south California and Arizona, *crinita* Texas and Mexico.

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75. **L. crinita** Burm.—Oblong-oval, distinctly broader behind, rufotestaceous, shining, head and thorax with moderately long erect hairs. Clypeus entire, concave, the margin rather widely reflexed, coarsely not closely punctured, front similarly punctured and with erect hairs. Thorax with entire margin, subcrenate posteriorly, disc with coarse punctures, evenly arranged over the entire surface, moderately closely placed, each with a moderately long, erect, yellow hair. Elytra with punctures distinctly coarser than on the thorax, evenly arranged and more closely placed than their own diameters, surface without hair, the discal costæ entirely obliterated. Pygidium coarsely, sparsely punctured, shining. Metasternum densely finely punctured, the hair long and yellow. Abdomen shining, a few fine, sparse punctures at the sides, last two segments with coarser punctures. Last joint of maxillary palpi slender, fusiform, not impressed. Claws variable in the sexes. Length .50—.64 inch; 13—16 mm.

MALE.—Club of antennæ one and a half times the length of the entire stem. Abdomen slightly impressed at middle, penultimate ventral slightly rugose at middle. Last ventral with an acute median impression. Tarsal claws feebly arcuate, the tooth small and slightly intramedian. Pygidium broader than long.

FEMALE.—Antennal club very short. Tarsal claws more curved and with a stronger tooth. Tarsi, especially the posterior, much shorter than in the male. Pygidium as long as wide.

VARIATIONS.—Nothing has been observed, except size.

The small group in which this species is placed has but three members, which are easily separated from each other. This one is noteworthy in having no hair on the elytra and the antennal club of male very long.

This species has, until now, borne the name *glabripennis* Lec., but I have no hesitation in restoring Burmeister's name, and am surprised that a fact so evident should have escaped recognition for so long a time.

Occurs in Texas, extending into Mexico.

76. **L. tristis** Fab.—Oblong-elongate, slightly broader behind, sometimes slightly oval, yellowish testaceous, sometimes slightly reddish, sparsely clothed with short semi-erect hair on the elytra, with longer erect hair on the thorax and at base of elytra. Clypeus entire, concave, coarsely sparsely punctured, not prolonged at sides on the eyes, front more densely punctured and with erect hair, not long. Thoracic margin entire, fimbriate with long hair, disc coarsely and rather closely punctured, hair long, erect and yellow. Elytra evenly punctured, the punctures closer than on the thorax, but not dense, pubescence sparse, short, semi-erect, with longer hairs at the base, extending somewhat along the suture, discal and submarginal costæ entirely obliterated. Pygidium coarsely and closely punctured with moderately long erect hairs. Metasternum densely finely punctured, the hair long, yellow and silken. Abdomen coarsely, usually moderately closely punctate, shining, the pubescence very

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short. Last joint of maxillary palpi short, ovate, slightly impressed. Claws slightly curved, the tooth acute, moderate in size and median ♀ or smaller and intramedian ♂. Length .45—.60 inch; 11.5—15 mm.

MALE.—Antennal club slightly longer than the stem. Abdomen flattened at middle, penultimate segment with a short, transverse, acute ridge near the anterior border, the last segment with the anterior margin elevated and a ridge prolonged backwards at middle.

FEMALE.—Antennal club as long as the funiculus. Pygidium less transverse than in the male. Tarsi equal in the sexes.

VARIATIONS.—As might be expected in a species with such wide distribution there is considerable variation, not only in size and color, but in sculpture. As a general rule northern specimens are larger and more elongate, the southern smaller and more dilated behind. Specimens received from northern Illinois are darker in color, the elytral punctuation quite close, while in the Georgia and Texas specimens the punctures are coarser and stand well apart. In the northern specimens the thoracic punctuation is denser and the surface less shining than the southern specimens.

The southern form has been determined by Dr. LeConte as *crinita*, but I have shown elsewhere that Burmeister had another species in view and described it well.

This species has probably the widest distribution of any in our fauna. I have seen specimens from the entire region east of the Rocky Mountains and from Oregon and Washington Territory.

77. **L. lenis** n. sp.—Oblong, slightly broader posteriorly, pale rufotestaceous, elytra testaceous, surface more or less pruinose, sparsely clothed with short erect hair, longer on the thorax and base of elytra. Clypeus entire, faintly truncate in front, acutely notched in front of the eye, concave, margin rather widely reflexed, punctuation coarse, almost cribrate, with very short hair, front cribrately punctured with longer hair. Thorax more glossy than the rest of the surface, margin subcrenate and ciliate, surface coarsely sparsely punctate, with moderately long erect hairs. Elytra with regularly disposed punctuation, the punctures as coarse as those of the thorax, not closely placed, sparsely clothed with short hairs, with longer hairs at the base extending sparsely along the suture, discal and submargiual costæ entirely obliterated. Pygidium coarsely sparsely punctured, with sparse semi erect hairs, with longer erect hairs intermixed. Metasternum densely punctured, the hair long, yellow and silky. Abdomen shining, slightly pruinose at the sides, sparsely punctate, smooth at middle, with very few, extremely short hairs. Last joint of maxillary palpi fusiform, not impressed Claws feebly arcuate, tooth moderate and acute, exactly median ♀, slightly intramedian ♂. Length .55—.60 inch; 14—15 mm.

MALE.—Antennal club pale testaceous, a little longer than the funiculus. Abdomen slightly impressed at middle, penultimate seg-

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ment (fig. 19) flattened at middle and rugosely punctured. Last ventral segment with a dentiform process, prolonged backward from the anterior margin and bifid at its tip.

FEMALE.—Antennal club nearly as long as the funiculus. Pygidium longer than in the male. Posterior tarsi very little shorter.

VARIATIONS.—Scarcely any variation has been observed, except in size. One specimen from southeastern California is brownish, but this is probably from bad preservation.

This species resembles some of the larger forms of *tristis*, but is distinctly less hairy. These two species are remarkable in the fact that the sides of the clypeus do not extend over the eye to form the canthus, so that when viewed directly from above the clypeus seems acutely notched immediately in front of the eye. This character is even better marked in this species than in *tristis*.

Among the numerous specimens examined there is a variation in the number of the joints of the antennæ. While the normal number is ten joints some have one antenna with nine only, and in several specimens it is not possible to determine with certainty how many joints there are between the scape and club.

Females seem to be rare, as there is but one of that sex in seventeen specimens.

Occurs in Arizona (Morrison) and southeastern California.

Group XVII, heterodoxa.

Form oblong-oval, surface shining, without hairs. Clypeus subtruncate, concave, margin rather widely reflexed. Last joint of maxillary palpi fusiform, not impressed. Antennæ 10-jointed. Margin of thorax slightly irregular. Anterior tibiæ normally tridentate. Posterior tibiæ with both spurs free in the two sexes. Claws unlike in the two sexes, and in the male dissimilar on various tarsi.

For reasons already given I prefer to retain this species as an aberrant Lachnosterna rather than separate it with a new generic name.

The claws of the anterior tarsi ♂ as represented in fig. 44 have a rather broad basal dilatation, the tooth, not projecting beyond it, of broadly triangular form, the apical portion of the claw curving down close to the tooth. The inner claw of the middle tarsus is like the front claw. The outer middle claw is very different. The tooth is very large and deflected to one side so that the claw is almost bifid,

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the claw is stronger and more arcuate than the others. The figures on the plate represent this claw as seen on the outer side (42) or inner side (43). The claws of the posterior tarsi are alike and do not greatly differ from those of the front feet, except that they are slightly more slender. The claws of all the tarsi of the female are of the ordinary Lachnosterna type as seen in the *fusca* group (fig. 46).

There is very little resemblance in the claws of the male to Phytalus, or in fact any of the genera of Rhizotrogini now known to me, and any separation of the species as a distinct genus must be based purely on the male sexual characters.

78. **L. heterodoxa** n. sp.—Oblong, pale rufotestaceous, head and thorax slightly darker, surface very glossy. Clypeus subtruncate, faintly sinuate at middle, margin moderately widely reflexed, surface moderately coarsely and closely punctate, front much more coarsely punctured. Thorax narrower in front, sides arcuate, the margin entire or subcrenate, with ciliæ, disc smooth with very sparse irregularly placed punctures, with large smooth intervals. Elytra with moderately coarse not closely placed punctures, the sutural costa alone distinct, the others entirely obliterated. Pygidium smooth, indistinctly sparsely punctate. Metasternum densely punctured, the hair moderately long, not dense, similar in sexes. Abdomen very sparsely punctate at the sides. Last joint of maxillary palpi fusiform, not impressed. Claws dissimilar in the sexes. Length .56 inch; 14 mm.

MALE.—Antennal club nearly one and a half times the length of the stem. Abdomen concave at middle, the last segment slightly granular with a linear median impression. Spurs of hind tibiæ slender and free. Claws unlike on the three pairs of legs. Pygidium broader than long, regularly convex.

FEMALE.—Antennal club shorter than the funicle. Tarsal claws normally toothed and similar on all the feet. Pygidium as long as wide, obtusely prominent near the apex. Hind tarsi shorter than in the male.

At first glance this species is not very unlike *crinita* in form and color, although with a more shining surface.

This species was collected with *fucata* in southern Arizona, or possibly in Chihuahua, by Mr. C. G. Pringle, a well-known botanical collector of Charlotte, Vermont.

To this group *L. ravida* Bl., of the Mexican fauna, should be referred. It resembles *heterodoxa*, but is more robust, the surface more coarsely punctured and less shining. The antennal club of the male is scarcely longer than the stem. The tooth of the claws is longer and less triangular. The outer claw of the middle tarsus is similar in the two species.

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Group XVIII, maculicollis.

In this group are placed three species of small size and of a facies quite different from all the preceding species, and presenting characters of almost generic value. The spurs of the hind tibiæ are free in both sexes; antennæ 9-jointed; claws with a small basal tooth. Last ventral segment small; anterior tibiæ bidentate, the upper tooth being entirely wanting; the anterior border of the thorax distinctly thickened.

The importance of most of these characters has already been alluded to by Dr. LeConte, but the bidentate front tibiæ seem to have escaped observation. He has, however, directed attention especially to the thickening of the front margin of the thorax and the slight pointing thereby in the direction of Listrochelus. In one of the species (*maculicollis*) there is on the occiput a similar transverse ridge, which prevents the head from being too far retracted, and to which I have directed attention as a characteristic of the vast majority of the species of that genus.

In the group as at present constituted the clypeus is entire, feebly truncate in *nitidula*, and the hind angles of the thorax are well defined in but one species. It is worthy of note that one species has the clypeus slightly coarctate at base as in *crinita* and *tristis*.

The three species may be separated in the following manner:

Thorax with a large, indistinctly limited piceous space.
  Hind angles of thorax rectangular: head with punctures not close, front flat; margin of body not ciliate; legs testaceous, not ciliate. ..... 79. **tusa.**
  Hind angles of thorax very obtuse; head roughly cribrate, front convex; margin of body fimbriate with moderately long hair; femora yellow, tibiæ and tarsi piceous, legs ciliate.....80. **maculicollis.**
Thorax entirely pale yellowish testaceous.
  Hind angles of thorax broadly rounded; head with very coarse punctures in two groups; margin of body with short ciliæ; legs testaceous, not ciliate. 81. **nitidula.**

These species are all from the southwestern limit of our fauna, the first from Texas, the others from Peninsula of California.

79. **L. tusa** n. sp.--Moderately elongate, subdepressed, slightly broader behind, beneath pale yellowish testaceous, thorax with large anterior piceous spot, elytra testaceous, but darker than the under side, surface moderately shining. Head piceous, shining. Clypeus concave, entire, the margin broadly reflexed, punctuation coarse and close, front flat, similarly punctured. Thorax narrower in front, apical border distinctly thickened, sides strongly arcuate in front, nearly parallel posteriorly, margin entire, ciliæ distant and short, hind angles distinct; disc with coarse punctures, less deeply impressed toward the sides, very regularly, but not closely placed. Elytral punctures coarser, closer and deeper than

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those of the thorax, the costæ very faintly indicated, the sutural distinct, margin not ciliate. Pygidium shining, with few scattered punctures. Metasternum sparsely punctate, the hairs short and inconspicuous. Abdomen obsoletely sparsely punctate at the sides, smooth at middle, without hairs. Legs yellowish testaceous, not ciliate, posterior femora very little stouter than the middle, claws arcuate, the tooth moderate, placed near the base. Palpi fusiform, not impressed. Length .47 inch; 12 mm.

MALE.—Antennæ pale, the club one and a half times the length of the stem. Abdomen flattened at middle. Last ventral segment with a transverse cupuliform depression, posterior margin of the penultimate segment elevated, a slight dentiform process at middle.

VARIATIONS.—The nine specimens examined are remarkably uniform in size, color and sculpture; they are all males.

This species so closely resembles *maculicollis*, that it might readily be supposed to be a mere color variety, but the characters separating them are many and important, the most obvious are the sculptnre of the head, the distinct hind angles of thorax and the absence of ciliation of the margin and legs.

Occurs near San Antonio, Texas. Collected by S. F. Aaron.

80. **L. maculicollis** Lec.—Oblong-oval, yellowish testaceous, elytra brownish testaceous, thorax with a large piceous spot, irregularly pentangular in form, the base in front, surface moderately shining. Head piceous, almost black, opaque. Clypeus almost semicircular, rather deeply concave, margin widely reflexed, coarsely closely punctate, front roughly cribrate. Thorax distinctly narrower in front, apical border slightly thickened, sides arcuate, margin entire, ciliate with long hairs, surface with moderately coarse, sparsely placed punctures, hind angles very obtuse. Elytra with coarser punctures than the thorax, more closely and regularly placed, margin ciliate with long hairs. Pygidium coarsely, sparsely punctured. Metasternum closely punctate, the hair sparse, but moderately long. Abdomen with very coarse, shallow punctures and with sparse erect hair. Last joint of maxillary palpi fusiform, slightly impressed. Legs sparsely ciliate with moderately long hairs, femora yellowish testaceous, tibiæ and tarsi brown, posterior femora short. Claws feebly arcuate, with a very small basal tooth. Length .48—.55 inch; 12—14 mm.

MALE.—Antennæ rufotestaceous, club brown, one and a third times longer than the entire stem. Abdomen without sexual peculiarity.

VARIATIONS.—Of this species four specimens have been examined showing no noteworthy variation.

The description of the color as given by Dr. LeConte is somewhat different from that given above. The entire under side and femora are pale yellowish testaceous. The thorax is a little darker in color, and the large piceous spot gives the species an appearance rather odd for the genus.

Collected at Cape San Lucas, Lower California, by John Xantus.

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81. **L. nitidula** Lec.—Elongate-oval, pale yellowish testaceous, head fuscous, moderately shining. Clypeus subtruncate, slightly concave, border narrowly reflexed, at base slightly coarctate, punctures coarse, not close, front more coarsely punctured, the punctures forming a dense group on each side. Thorax narrowed in front, anterior border narrowly thickened, sides arcuate, entire, fimbriate, hind angles rounded; disc with moderate punctures, regularly disposed, not closely placed. Elytral punctures coarser and rather closer than those of the thorax, the sutural costa distinct, the others obliterated, margin with short fimbriæ. Pygidium finely alutaceous, sparsely rather finely punctate. Metasternum sparsely indistinctly punctate, the hairs moderate in length, but sparse. Abdomen sparsely punctate, each puncture with a short recumbent hair. Legs with very few hairs, claws feebly arcuate with a small basal tooth. Last joint of maxillary palpi fusiform, with an obsolete impression. Length .45 inch; 11.5 mm.

MALE.—Antennal club nearly one and a half times the length of the stem. Ventral characters absent.

FEMALE.—Antennal club as long as the funiculus. Tooth of claws near the middle and slightly stronger than in the male.

VARIATIONS.—None have been observed.

This species has very decidedly the facies of a Cyclocephala of elongate form (e. g. *longula*), in both form and color. The rounded hind angles of the thorax is of very rare occurrence in the genus, there being but one other pronounced case in a preceding group (*ecostata*).

Occurs at Cape San Lucas, Lower California. Collected by Mr. John Xantus.

LACHNOSTERNA Hope.

Synonyms: *Trichestes* Erichs. *Ancylonycha* and *Tostegoptera* Blanch. *Eugastra*, *Endrosa* and *Gynnis* Lec.

Essays of a General Nature.

Knoch.—Neue Beytrage zur Insectenkunde. Leipzig, 1801.

Blanchard.—Catalogue de la collection entomologique du Muséum d'Histoire Naturelle de Paris. Paris, 1850.

Burmeister.—Handbuch der Entomologie vol. iv, 2. Berlin, 1855.

LeConte.—Synopsis of the Melolonthidæ of the United States. Jour. Acad. Nat. Sci. ser. ii, vol. iii. Philadelphia, 1856.

Group I.

1. L. **lanceolata** Say (*Melolontha*), Journ. Acad. iii, p. 242; edit. Lec. 2, p. 142; Blanch. (*Tostegoptera*), p. 149; Burm., p. 356; Lec. (*Lachnosterna*) p. 237.

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Group II.

2. L. **cribrosa** Lec. (*Tostegoptera*), Proc. Acad. 1853, p. 231; (*Eugastra*) Proc. Acad. 1854, p. 217; Revis. p. 234.
ventricosa Lec., Proc. Acad. 1853, p. 440; 1854, p. 217; Revis. p. 234.
3. L. **æqualis** Lec. (*Tostegoptera*), Proc. Acad. 1853, p. 440; Revis. (*Lachnosterna*) p. 238.
4. L. **farcta** Lec., Revis. p. 238.

Group III.

5. L. **torta** Lec., Revis. p. 239.
6. L. **hamata** n. sp.

Group IV.

7. L. **latifrons** Lec., Revis. p. 241.
8. L. **generosa** n. sp.
9. L. **prætermissa** n. sp.
10. L. **prununculina** Burm. (*Ancylonycha*), p. 360.
cerasina Lec., Revis. p. 241.
11. L. **glaberrima** Blanch. (*Ancylonycha*), p. 136; Lec. (*Lachnosterna*), p. 242.
12. L. **ephilida** Say (*Melolontha*), Jour. Acad. v, p. 196; edit. Lec. ii, p. 298; Burm. (*Trichestes*), p. 359; Lec. (*Lachnosterna*), p. 241.
uniformis Blanch. (*Ancylonycha*), p. 133.
Burmeisteri Lec., Revis. p. 242.

Group V.

13. L. **longitarsis** Say (*Melolontha*), Jour. Acad. iii, p. 241; edit. Lec., ii, p 141; Burm. (*Trichestes*), p. 359; Lec. (*Lachnosterna*), Revis. p. 240.
frontalis Lec., Revis. p. 239.
14. L. **clemens** Horn.
dispar ‡ Lec., Revis. p. 240.

Group VI.

15. L. **dispar** Burm. (*Trichestes*), p. 361.
debilis Lec. (*Gynnis*), Revis. p. 262.

Group VII.

16. L. **gracilis** Burm. (*Trichestes*), p. 361.
volvula Lec. (*Endrosa*), Revis, p. 235.
inana Lec., Revis. p. 242.
17. L. **gibbosa** Burm. (*Ancylonycha*), p. 324.
futilis ♂ Lec., Revis. p. 243.
serricornis ♀ Lec., Revis. p. 247.
18. L. **hirtiventris** n. sp.
19. L. **congrua** Lec., Revis. p. 243.
20. L. **postrema** n. sp.
21. L. **affinis** Lec., Revis. p. 252.
22. L. **prunina** Lec., Revis. p. 251.
pruinosa ‖ Mels. (*Ancylonycha*), Proc. Acad. ii, p. 140.
fraterna ‡ Burm. (*Ancylonycha*), p. 322.

Group VIII.

23. L. **calceata** Lec., Revis. p. 250.

Group IX.

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24. L. **crassissima** Blanch. (*Ancylonycha*), p. 133.
obesa Lec., Revis. p. 251.
robusta ♀ Lec. Revis. p. 257.
25. L. **subpruinosa** Casey, Contributions, p. 38.
26. L. **errans** Lec., Proc. Acad. 1859, p. 283.

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27. L. **inversa** n. sp.
28. L. **bipartita** n. sp.
29. L. **micans** Knoch (*Melolontha*), p. 77; Burm., p. 323; Lec., Revis. p. 247.
    sororia ♀ Lec., Revis. p. 246.
30. L. **diffinis** Blanch. (*Ancylonycha*) p. 138.
31. L. **vehemens** n. sp.
32. L. **fusca** Froehlich (*Melolontha*), Naturforscher 26, p. 99; Lec., Revis. p. 244.
    quercina Knoch (*Melolontha*), p. 74, pl. 1, fig. 7; Lec., Agass. Lake Super. p. 226; Burm., p. 319.
    fervens Gyll (*Melolontha*), Schönh. Syn. Ins. 1, 3, App. p. 74.
    fervida ‡ Oliv. (*Melolontha*), Ent. i, 5, p. 24, pl. 9, fig. 109.
    var. *consimilis* ♂ Lec., Agass. Lake Super. p. 226.
    var. *anxia* ♀ Lec., Agass. Lake Super. p. 226.
        brevicollis Blanch., p. 132.
    var. *puncticollis* Blanch., p. 133.
    var. *Drakii* Kby., Faun. Bor. Am. iv, p. 133.
  Race *cephalica* Lec., Revis. p. 245.
    uninotata Walker, Naturalist in Vancouver, ii, p. 323.

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33. L. **politula** n. sp.
34. L **barda** n. sp.
35. L. **marginalis** Lec., Revis. p. 250.
36. L. **spreta** n. sp.
37. L. **fraterna** Harris (*Phyllophaga*) Insects injurious to vegetation, p. 29; Lec., Revis. p. 249.
    var. *cognata* Burm., p. 323; Lec. Revis. p. 248.
    var. *Forsteri* Burm., p. 325.
        lugubris Lec., Revis. p. 248.
        lutescens Lec., Revis. p. 249.
    var. *semicribrata* Lec., Revis. p. 247.

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38. L. **infidelis** n. sp.
39. L. **luctuosa** n. sp.
40. L. **corrosa** Lec., Revis. p. 249.
41. L. **scitula** n. sp.
42. L. **Knochii** Gyll. (*Melolontha*), Schönh. Syn. Ins. i, 3, App. p. 75; Burm. (*Ancylonycha*), p. 325; Lec., Revis. p. 252.
43. L. **profunda** Blanch. (*Ancylonycha*), p. 132.
44. L. **rugosa** Mels. (*Ancylonycha*), Proc. Acad. ii, p. 140; Burm., p. 328; Lec., Revis. p. 252.

Group X.

45. L. **hirsuta** Knoch (*Melolontha*), p. 78; Lec., Revis. p, 254.
46. L. **comans** Burm. (*Trichestes*), p. 358.
    sororia ♂ Lec., Revis. p. 246.
    decidua Lec., Revis. p. 246.
    rufiola ♀ Lec., Revis. p. 256.
47. L. **implicita** n. sp.
48. L. **balia** Say (*Melolontha*), Jour. Acad. v, 2 194; edit. Lec. ii, p. 297; Lec., Revis. p. 255.
    comata Burm., p. 337.
49. L. **villifrons** Lec., Revis. p. 255.
    hirticeps ♀ Lec., Revis. p. 255.
50. L. **limula** n. sp.
51. L. **nitida** Lec., Revis. p. 256.

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Group XI.

52. L. **hirticula** Knoch (*Melolontha*), p. 79; Harris, Ins. Injur. to Veg. p. 29: Burm., p. 327; Lec., Revis. p. 254.
hirsuta ‡ Say, Jour. Acad. iii, p. 243; edit. Lec. ii, p. 142.
53. L. **delata** n. sp.
54. L. **ilicis** Knoch (*Melolontha*), p. 75, pl. i, fig. 28; Lec., Revis. p. 253.
porcina Hentz, Trans. Am. Philos. Soc. iii, p. 253, pl. iii, fig. 4.
fimbriata Burm., p. 326.
subtonsa Lec., Revis. p. 254.
var. *ilicis* Burm., p. 326.
55. L. **ciliata** Lec., Revis. p. 253.

Group XII.

56. L. **æmula** n. sp.
57. L. **arcta** n. sp.
58. L. **crenulata** Fröhl. (*Melolontha*), Naturf. 26, p. 94; Burm., p. 327; Lec., Revis. p. 258.
georgicana Gyll. Schöh. Syn. Ins. i, 3, App. p. 77.
59. L. **albina** Burm. (*Ancylonycha*), p. 328; Lec., Revis. p. 258.
60. L. **vetula** n. sp.
61. L. **rubiginosa** Lec., Revis. p. 259.
62. L. **parvidens** Lec., Revis. p. 259.

Group XIII.

63. L. **submucida** Lec., Revis. p. 260.
64. L. **glabricula** Lec., Revis. 260.
65. L. **fucata** n. sp.
66. L. **exorata** n. sp.

Group XIV.

67. L. **ignava** n. sp.
68. L. **longicornis** Blanch. (*Ancylonycha*), p. 134.

Group XV.

69. L. **quercus** Knoch (*Melolontha*), p. 72, pl. i, fig. 26; Burm., p. 340; Lec. (*Endrosa*), Revis. p. 234.
fervida ‡ Schönh., Syn. Ins. i, 3, p. 171.
70. L. **inepta** n. sp.
71. L. **affabilis** n. sp.
72. L. **clypeata** Horn, Entomol. Americana iii, p. 145.
integra ‖ Lec., Revis. p. ~~255.~~ 258
73. L. **boops** n. sp.
74. L. **ecostata** n. sp.

Group XVI.

75. L. **crinita** Burm. (*Trichestes*), p. 359.
glabripennis Lec., Revis. p. 260.
76. L. **tristis** Fab. (*Melolontha*), Spec. Ins. 1, 39; Burm. (*Trichestes*), p. 358; Lec., Revis. p. 261.
pilosicollis Knoch (*Melolontha*), p. 85, pl. i, fig. 29; Say, Journ. Acad. iii, p. 243; edit. Lec. ii, p. 143.
crinita ‡ Lec., Revis. p. 261.

Group XVII.

78. L. **heterodoxa** n. sp.

Group XVIII.

79. L. **tusa** n. sp.
80. L. **maculicollis** Lec., New Species 1863, p. 76.
81. L. **nitidula** Lec., New Species 1863, p. 77.

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EXPLANATION OF PLATE III.

Fig. 1.—Head and thorax of *L. longitarsis.*
" 2.— " " *L. tristis.*
" 3.— " " *L. latifrons.*
" 4.—Antenna, 10-jointed of *L. crassissima.*
" 5.—Antenna, 9-jointed of *L. villifrons.*
" 6.—Front leg of *L. exorata.*
" 7.—Hind leg ♂ of *L. lanceolata.*
" 8.—Hind leg ♀ of "
" 9.—Hind tibia ♂ of *L. vehemens; a, b, c,* abnormal? front claws ♂.
" 10.— " " ♂ of *L. fusca.*
" 11.— " " ♂ of *L. hamata.*
" 12.— " " ♂ of *L. torta.*
" 13.— " " ♂ of *L. hirtiventris; a,* the claw.
" 14.— " " ♂ of *L. gibbosa* (futilis *Lec.*).
" 15.— " leg ♂ of *L. calceata.*
" 16.— " " ♂ of *L. prununculina.*
" 17.—Last two ventral segments *L. hirtiventris* ♂.
" 18.— " " " " *L. vetula* ♂.
" 19.— " " " " *L. lenis* ♂.
" 20.— " " " " *L. boops* ♂.
" 21.— " " " " *L. ephilida* ♂.
" 22.— " " " " *L. luctuosa* ♀.
" 23.—Penultimate ventral ♂ *L. fucata.*
" 24.— " " ♂ *L. submucida.*
" 25.— " " ♂ *L. implicita.*
" 26.— " " ♂ *L. bipartita.*
" 27.— " " ♂ *L. prunina.*
" 28.— " " ♂ *L. marginalis.*
" 29.— " " ♂ *L. vehemens.*
" 30.— " " ♂ *L. fusca.*
" 31.— " " ♂ *L. fusca,* race *cephalica.*
" 32.— " " ♂ *L. errans.*
" 33.— " " ♂ *L. delata.*
" 34.— " " ♂ *L. inversa.*
" 35.— " " ♂ *L. ilicis.*
" 36.— " " ♂ *L. generosa.*
" 37.— " " ♂ *L. calceata.*
" 38.— " " ♂ *L. profunda.*
" 39.— " " ♂ *L. luctuosa.*
" 40.— " " ♂ *L. scitula.*
" 41.— " " ♂ *L. corrosa.*
" 42.—Outer middle claw of *L. heterodoxa* ♂, outer view.
" 43.— " " " of " ♂, inner view.
" 44.—Front claw. the inner middle is also similar.
" 45.—Posterior claw.
" 46.—Claw of ♀, similar throughout.

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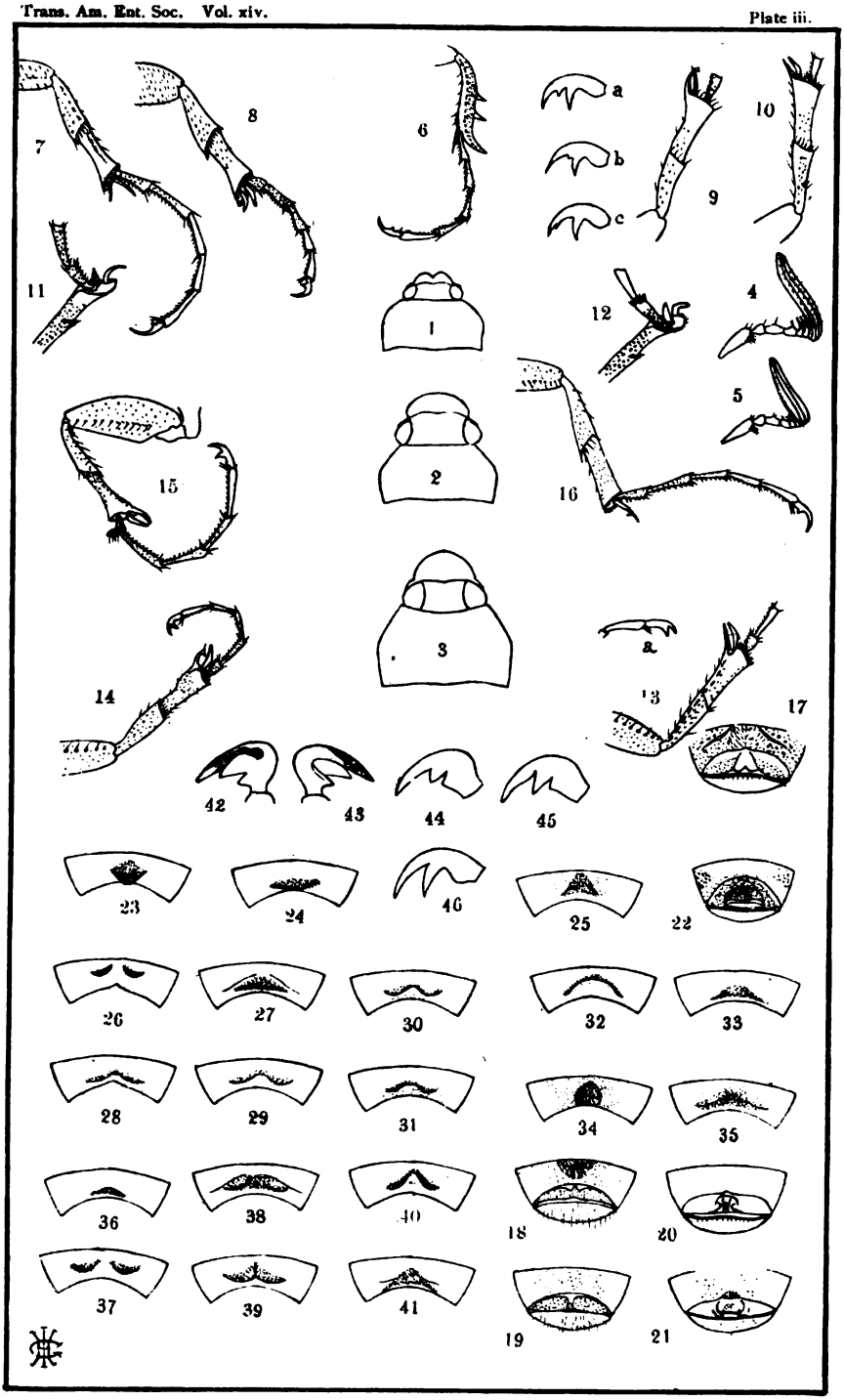

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PROCEEDINGS

OF THE

MONTHLY MEETINGS

OF THE

ENTOMOLOGICAL SECTION

OF THE

ACADEMY OF NATURAL SCIENCES,

PHILADELPHIA.

JANUARY 27, 1887.

Director Dr. HORN in the chair.

The following additions to the Library of the American Entomological Society were announced:

Entomologica Americana, vol. ii, Nos. 9-10. From the Editor.

Canadian Entomologist, vol. xviii, No. 10. From the Editor.

Entomologist's Monthly Magazine for January, 1887. From the Conductors.

Psyche, vol. iii, Nos. 103 and 104. From the Editors.

Biologia Centrali-Americana; Coleoptera, vol. i, part 2, pp. 633–672, pl. 16; vol. iv, part 1, pp. 225–264, pl. 10; vol. vi, part 1, pp. 481–496, pl. 27. Heterocera, pl. 19–20. Diptera, pp. 73–128, pl. 2. Arachnida, pp. 1–8, pl. 1–3. By purchase.

Descriptive notices of North American Coleoptera, I, by Thos. L. Casey. From the Author.

Descriptions of New Species of Hymenoptera in the collection of the British Museum, by Frederick Smith. By purchase.

The Butterflies of New England, by C. J. Maynard. By purchase.

Le Naturaliste Canadien, vol. xvi, No. 6. From the Editor.

Zur Kenntniss der Chilenischen Carabinen, von August Morawitz. From the Author.

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Zur Kenntniss der Adephagen Coleoptera, von August Morawitz From the Author.

Genera Crustaceorum et Insectorum, par P. A. Latreille, 4 vols. By purchase.

The following were presented by the author, A. Preudhomme de Borre:

Listes des especes de Coleopteres Carnassiers Terrestres et Aquatiques.

Note sur les Crustaces Isopodes de la Belgique.

Materiaux pour la Faune Entomologiques des Flandres, Coleoptères, Troisoieme Centurie.

Note sur le Geotrupes Stercorarius L. et les especes voisines.

The following were presented by the author, Dr. G. Mayr:

Ueber Eciton-Labidus.

Die australischen Formiciden.

Formicidæ novogranadenses.

Beitrage zur Ameisen-Fauna Asiens.

Formiciden, Gesammelt in Brazilien von Prof. Trail.

Cremastogaster Ransonneti, n. sp.

Formicidæ Borneenses.

Vorlaufige Studien über die Radobog-Formiciden.

Drei neue Ost-Indische Formiciden-Arten.

Fourmis de Cayenne Francaise, par O. Radoszkowsky. From Dr. G. Mayr.

Paper 201 was read by title and referred to Publication Committee.

Special committee appointed to audit Treasurer's account report that the accounts and vouchers had been examined and found correct.

The Publication Committee reported in favor of the following paper: On the Cynipidous Galls of Florida, with descriptions of new species, and a synopsis of the described species of N. America, by W. H. Ashmead.

Mr. Bland exhibited some specimens of *Platynus lutulentus*, and alluded to the offensive odor produced by living specimens.

Dr. Horn gave some details of a study of Aphodius and allied genera, illustrated by specimens and blackboard sketches.

A communication was received from S. Frank Aaron, and his name was ordered stricken from the roll.

Mr. George B. Cresson was proposed for membership.

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FEBRUARY 24, 1887.

Director Dr. HORN in the chair.

There being no quorum the Section, after conversation, adjourned.

MARCH 24, 1887.

Director Dr. HORN in the chair.

The following additions to the Library of the American Entomological Society were announced:

Entomologica Americana, vol. ii, Nos. 11–12. From the Editor.

Canadian Entomologist, vol. xviii, Nos. 11–12; xix, Nos. 1–2. From the Editor.

Proceedings of the Academy of Natural Sciences, Philadelphia, 1886. Part 3. From the Academy.

Transactions of the American Entomological Society, vol. xiii, Nos. 3–4. From the Publication Committee.

Psyche, vol. ix, Nos. 135–137. From the Editors.

Journal of the Trenton Natural History Society, No. 2. From the Society.

Bulletin of the Museum of Comparative Zoology, vol. xiii, No. 2. From the Museum.

The Butterflies of Eastern United States, by G. H. French. By purchase.

Entomologist's Monthly Magazine, vol. xxii, Nos. 273–274. From the Conductors.

Biologia Centrali-Americana: Coleoptera, vol. ii, part 1, pp. 1–16, pl. 1; vol. ii, part 2, pp. 673–736, pl. 17–18; vol. iv, part 1, pp. 265–273, pl. 11; vol. vi, part 1, pp. 497–504, pl. 28. Heterocera, plate 21. Hymenoptera, pp. 329–376, pl. 14–15. Diptera, pp. 129–176. By purchase.

Journal and Proceedings of the Royal Society of New South Wales, vol. xix, 1885. From the Society.

Le Naturaliste Canadien, vol. xvi, Nos. 5, 7 and 8. From the Society.

Berliner Entomologische Zeitschrift, 1886. From the Society.

Die Genera der gallenbewohnenden Cynipiden von Dr. G. Mayr. From H. F. Bassett.

Die Formiciden der Vereinigten Staaten von Nord-amerika, von Dr. G. Mayr. From the Author.

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Catalogue des Coléoptères Carnassiers Aquatiques, par C. Van den Branden. From the Author.

The Publication Committee laid on the table the first number of vol. xiv of the Transactions.

A paper entitled: A Monograph of the Aphodinii of the United States by Geo. H. Horn, M.D., was reported favorably, and the report adopted.

The Custodian announced that a number of types of Cynipidæ and Chalcididæ had been sent for the cabinet of the American Entomological Society by Mr. W. H. Ashmead.

Paper No. 202 was read by title and referred.

Mr. George B. Cresson was elected to membership, and the following associates admitted: Ernest Seeber, Philip P. Calvert, Charles S. Welles and Frank Haimbach.

Before the close of the meeting Dr. Horn exhibited his series of Aphodinii and adverted to the differences between the various genera.

April 28, 1887.

Director Dr. Horn in the chair.

The following additions to the Library of the American Entomological Society were announced:

A monograph of the Aphodinii inhabiting the United States, by G. H. Horn, M.D. From the Author.

Transactions of the American Entomological Society, vol. xiv, No. 1. From the Publication Committee.

Entomologica Americana, vol. iii, No. 1. From the Editor.

Canadian Entomologist, vol. xix, No. 3. From the Editor.

Bulletin of the Museum of Comparative Zoology, vol. xiii, No. 3, From the Museum.

Nineteenth Annual Report of the Peabody Academy of Sciences. From the Academy.

Bulletin of the Scientific Association, Peoria, Illinois, 1887. From the Association.

Entomologist's Monthly Magazine, vol. xxiii, No. 275. From the Conductors.

Bulletino della Societa Entomologica Italiana, 1886, No. 4, 1887, Nos. 1-2. From the Society.

Bulletin de la Société Imperiale des Naturalistes de Moscow, 1886. Nos. 2-3. From the Society.

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Deutsche Entomologische Zeitschrift, 1886, No. 2. From the Society.

Verhandlungen der kaiserlich-königlichen zoologisch-botanischen Gesellschaft in Wien, vol. xxxvi, Nos. 3–4. From the Society.

The Publication Committee reported in favor of the publication of a paper by Rev. W. J. Holland, entitled:

Notes upon a small collection of Rhopalocera made by Rev. B. C. Henry in the Island of Hainan, together with descriptions of some apparently new species.

Report of Custodian was read.

Mr. Wenzel exhibited specimens of *Aphodius phalerioides* taken by him on the white sands south of Atlantic City near the beach.

Paper 203 was read by title and referred to Publication Committee.

Dr. Henry Skinner read the following note and exhibited the specimens in illustration:

Variation in **Argynnis Myrina.**—The descriptions are taken from two specimens, male and female, captured by Mr. G. H. Parker in Fairmount Park, Philadelphia. The male differs from the normal in having the space between the two zig-zag lines which run from the costa across the middle of the wing to the interior margin of the superiors filled in with inky black. Between this and the base are two solid black spots. The tawny spots on the exterior margin of the superiors are absent. The reticulation of the inferior wings is replaced by black. The under surface of the superiors differs in having the small hollow circles replaced by solid black dots which are larger than the replaced circles. The under surface of the inferiors shows no difference. The female is considerably lighter in color, but otherwise the variations are not nearly so well marked as in the male. These being the only abnormalities I have ever noticed in the species, the above descriptions may be of interest.

May 26, 1887.

Director Dr. Horn in the chair.

The following additions to the Library of the American Entomological Society were announced:

Transactions of the American Entomological Society. Supplementary volume, 1887, Part 1. From the Publication Committee.

Canadian Entomologist, vol. xix, No. 4. From the Editors.

Entomologica Americana, vol. iii, No. 2. From the Editor.

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Bulletins 10–12 of the Division of Entomology, U. S. Department of Agriculture. From Prof. C. V. Riley.

Transactions of the Entomological Society of London, 1886. From the Society.

Entomologist's Monthly Magazine, May, 1887. From the Conductors.

Biologia Centrali-Americana: Coleoptera, vol. i, pt. 2, pp. 737–744, pl. 19; vol. ii, pt. 1, pp. 17–56, pl. 2. Hymenoptera, pp. 377–400, pl. 16. Heterocera, vol. i, pp. 201–224, pl. 22–23. Diptera, pp. 177–216, pl. 3. Acaridea, pl. 4–6. By purchase.

Le Naturaliste Canadien, vol. xvi, No. 10. From the Editor.

The Custodian reported an arrangement of the Coleoptera as far as the Cucujidæ in the list.

Dr. Horn spoke of the species of Lachnosterna, alluded to their superficial similarity and indicated the importance of the sexual characters of the males in the separation of species. The more important were illustrated by sketches on the blackboard.

Joseph G. McFarland was received as an associate member.

June 13, 1887.

Director Dr. Horn in the chair.

The following additions to the Library of the American Entomological Society were announced:

Proceedings of the Boston Society of Natural History, 1887, sig. 21. From the Society.

Bulletin of the Essex Institute, vol. xviii, Nos. 7–12. From the Institute.

Canadian Entomologist, vol. xix, No. 6. From the Editor.

Entomologist's Monthly Magazine, June, 1887. From the Conductors.

Proceedings of the Zoological Society of London, 1886. From the Society.

Fitch's Noxious and Beneficial Insects of New York, Reports 1–9. From H. C. Wilt.

Verhandlungen des Naturhistorischen Vereines der preussischen Rheinlande, 1886, part 2. From the Society.

The Publication Committee reported in favor of a paper entitled:

Studies of North American Chalcididæ, with descriptions of new species, by William H. Ashmead.

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The Report of the Custodian was read.

Dr. Horn stated that since last meeting he had visited Cambridge and had studied the Lachnosternæ of the LeConte collection. The collection is in good order and well preserved.

From Dr. Hagen he had obtained two larvæ collected at Sierra Leone, Africa, which he had no doubt were *Glyptus sulcatus*. In due time he hoped to prepare descriptions and figures.

Mr. Wenzel gave an account of a recent visit to Virginia in company with Mr. Liebeck. *Dicœlus dilatatus* was found feeding on snails.

Mr. Blake moved an appropriation of ten dollars to Mr. Coburn for extra services in the care of the room.

Mr. Gilbert C. Wood was received as an associate.

On motion of the Recorder the Section was adjourned until Sept.

SEPTEMBER 22, 1887.

Director Dr. HORN in the chair.

The following additions to the Library of the American Entomological Society were announced:

Canadian Entomologist, vol. xix, Nos. 7–9, 1887. From the Editor.

Proceedings of the Academy of Natural Sciences of Philadelphia, 1887, part 1. From the Academy.

Bulletin of the Museum of Comparative Zoolology, vol. xiii, No. 4. From the Museum.

Proceedings of the Zoological Society of London, 1887, part 1. From the Society.

Journal of the Linnean Society of London, Zoology, vols. xix–xxi, Nos. 114–129, 1886–87. From the Society.

Proceedings of the Linnean Society of London, November, 1883 to June, 1887. From the Society.

Entomologist's Monthly Magazine, Nos. 278–280, 1887. From the Conductors.

Seventeenth Annual Report of the Entomological Society of Ontario. From the Society.

Bulletin of the Division of Entomology, U. S. Department of Agriculture, Nos. 13–15. From C. V. Riley.

Bulletin of the Illinois State Laboratory of Natural History, vol. iii, No. 1. From the Laboratory.

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Synopsis of the North American Syrphidæ, by S. W. Williston, M.D. From the Author.

Our Shade Trees and their Insect Defoliators, by C. V. Riley. From the Author.

Biologia Centrali-Americana: Coleoptera, vol. ii, part 1, pp. 57-64; part 2, pp. 25-80, pl. 2-4; vol. iv, part 1, pp. 273-296; vol. vi, part 1, pp. 505–528, pl. 29. Rhopalocera, vol. ii, pp. 1–48, pl. 48-51. Heterocera, vol. i, pp. 225–248, pl. 24. Arachnidæ, pp. 9-16, pl. 7-8. By purchase.

Le Naturaliste Canadien, vol. xvi, No. 12; xvii, No. 1. From the Editor.

Bulletin de la Société Imperiale des Naturalistes des Moscow, 1886, No. 4, 1887, Nos. 1-2. From the Society.

Annales de la Société Entomologique de Belgique, vol. xxx, 1886. From the Society.

Mittheilungen der Schweizerischen Entomologischen Gesellschaft. vol. vii, Nos. 8-9, 1887. From the Society.

Deutsche Entomologische Zeitschrift, vol. i, 1887. From the Society.

Berliner Entomologische Zeitschrift 1887, No. 1. From the Society.

Horæ Societatis Entomologicæ Rossicæ, vol. xx, 1886. From the Society.

Catalogue des Trogides.—Liste des Lamellicornes Laparostictiques. —Note sur les genre Hapalonychus, Westw., par A Preudhomme de Borre. From the Author.

The Custodian reported his work during the summer months.

Paper 204 was read by title and referred to Publication Committee.

A specimen of a pink Katydid was presented by Dr. Charles Schæffer through Prof. J. A. Ryder, who reported that similar specimens had been found by Prof. Baird at Wood's Holl last year.

Dr. Horn referred to *Dinapate Wrighti* described by him last year, and stated that this year the section of tree had failed to yield any specimens.

A pair of Longicorns was exhibited recently collected by Mr. E. A. Schwarz in Florida, indicating a new genus allied to *Agallissus*.

The larva of a *Monilema*, probably *obtusum*, was exhibited, collected by W. G. Wright in the Mojave Desert, living in the roots of *Opuntia basilaris*. Dr. Horn thought that all the Monilemæ were Cactus feeders.

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October 27, 1887.

Director Dr. Horn in the chair.

The following additions to the Library of the American Entomological Society were announced:

Canadian Entomologist, vol. xix, No. 10. From the Editor.

Report of the Entomologist, Charles V. Riley, for the year 1886. From the Entomologist.

Proceedings of the Zoological Society of London, 1887, part 2. From the Society.

Proceedings of the Linnean Society of New South Wales, 2d ser. vol. ii, part 2. From the Society.

Entomologist's Monthly Magazine, October, 1887. From the Conductors.

Notes on some Illinois Microgasters, with descriptions of new species, and on the parasites of the Lesser Apple Leaf-Roller—Teras minuta, by Clarence M. Weed. From the Author.

Biologia Centrali-Americana: Coleoptera, vol. i, part 2, pp. 745-768; vol. ii, part 2, pp. 81-104, pl. 5-6; vol. iv, part 1, pp. 297-320, pl. 12-13; vol. vi, part 1, pp. 529-544, pl. 30; vol. vii, pp. 1-32, pl. 1. Hymenoptera, pp. 401-416. Rhopalocera, vol. ii, pp. 49-96, pl. 52-53. Heterocera, vol. i, pp. pp. 249-256, pl. 25. Rhynch.-Homoptera, pp. 25-32, pl. 4. Arachnidæ, pl. 10-11. By purchase.

A Synopsis of the Central American species of Joppa, with diagnoses of new species.—A Synopsis of the British species of Cimbicidina, Hylotomina, Lophyrina and Lydina.—A Synopsis of the British species of Cephina—Hymenopterological. Notes.—On some Hymenoptera from Japan and the Pacific. On the Hymenoptera of the Hawaiian Islands. By Peter Cameron. From the Author.

The Publication Committee reported in favor of a paper entitled: "Monograph of the North American species of the Dipterous genus Anthrax," by D. W. Coquillett.

Mr. Calvert noted the occurrence of *Papilio Ajax* in Fairmount Park. Its occurrence in various places about Philadelphia was mentioned by Messrs. Liebeck, Wenzel and Laurent.

Recent captures of Coleoptera were exhibited by Mr. Wenzel.

Dr. Horn stated that Mr. Uhler had informed him that the pink Katydids were merely monstrosities due to a retardation of color development. Specimens are occasionally found partly pink and partly green.

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Work on a monograph of Lachnosterna was alluded to by Dr. Horn, and from the material now in hand about eighty species were indicated.

Many of those present gave their experience as to the time and method of capturing Lachnosterna.

NOVEMBER 24, 1887,

Being a legal holiday, no meeting was held.

DECEMBER 12, 1887.

Director Dr. HORN in the chair.

The Treasurer of the Section presented his report, which was referred to a committee consisting of Messrs. Knight, McAllister and Lewis for examination and report.

Paper 205 was read by title and referred to Publication Committee.

Dr. Horn announced that at the next meeting he would exhibit his full series of Lachnosterna.

Dr. McCook read a request from a gentleman in Liverpool for specimens of *Mygale Hentzii*, and asked the assistance of the members. He also stated that he had opened negotiations for an exchange of specimens of insect architecture.

An election for officers for 1888 being now in order, a ballot was taken, and the following were chosen:

Director,—G. H. Horn, M.D.
Vice-Director,—Rev. H. C. McCook, D.D.
Recorder,—James H. Ridings.
Treasurer,—E. T. Cresson.
Publication Committee,—Henry Skinner, M.D., Philip Laurent.

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ERRATA.

Page 160, line 1, for Genera *read* Species.
" 163, line 29, for 5-shaped *read* S-shaped.
" 163, line 31, for 5-shaped *read* S-shaped.
" 164, line 5, insert an ! after California.
" 165, line 32, insert an ! after California.
" 171, number 22, for camprestris *read* campestris.

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